



California's Groundwater Update 2013:

A Compilation of Enhanced Content for
California Water Plan Update 2013

North Coast, North Lahontan, South Lahontan,
and Colorado River Hydrologic Regions

September 9, 2015

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California Department of Water Resources



California's Groundwater Update 2013

Webinars

Hydrologic Region Webinar: June 4, 2015

- Tulare Lake, San Joaquin River, Central Coast
- <http://www.waterplan.water.ca.gov/topics/groundwater/index.cfm>

Hydrologic Region Webinar: July 27, 2015

- Sacramento River, San Francisco Bay, South Coast

Hydrologic Region Webinar and Technical Appendices Webinar: September 9, 2015

- North Coast, Colorado River, North & South Lahontan
- Technical Appendices



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Chronology of Groundwater Content in Previous Water Plans

CWP UPDATE	CHRONOLOGY OF GROUNDWATER CONTENT IN THE CALIFORNIA WATER PLAN
1957	<ul style="list-style-type: none"> Groundwater is discussed primarily in terms of additional storage capacity and water supply.
1970	<ul style="list-style-type: none"> Discussed what is required to locally manage groundwater basins, including potential new regulations.
1974	<ul style="list-style-type: none"> Discussed groundwater policy to limit development. Described groundwater basin by region. Provided map of San Joaquin Valley aquifer levels in wet and dry periods.
1983	<ul style="list-style-type: none"> Acknowledged groundwater data limitations.
1987	<ul style="list-style-type: none"> Discussed overdraft. Provided examples of managed basins. Mentioned conjunctive use and the Kern Water Bank.
1993	<ul style="list-style-type: none"> Provided groundwater supply estimates. Provided groundwater use by hydrologic region.
1998	<ul style="list-style-type: none"> Described overdraft as unsustainable. Acknowledged relationship between overdraft rates and surface water supply availability.
2005	<ul style="list-style-type: none"> Introduced groundwater-related resource management strategies.
2009	<ul style="list-style-type: none"> Expanded discussion of groundwater-related resource management strategies: <ul style="list-style-type: none"> Conjunctive management and groundwater storage. Groundwater and aquifer remediation. Recycled Municipal Water. Recharge Area Protection.
	<ul style="list-style-type: none"> Recommended expanded groundwater content for future CWP updates.



California's Groundwater Update 2013

Three Main Goals

1. Improve statewide and regional understanding of groundwater conditions and management.
2. Identify data gaps and groundwater management challenges.
3. Develop recommendations to improve groundwater management in California.

California's Groundwater Update 2013

A Compilation of
Enhanced Content for
California Water Plan
Update 2013

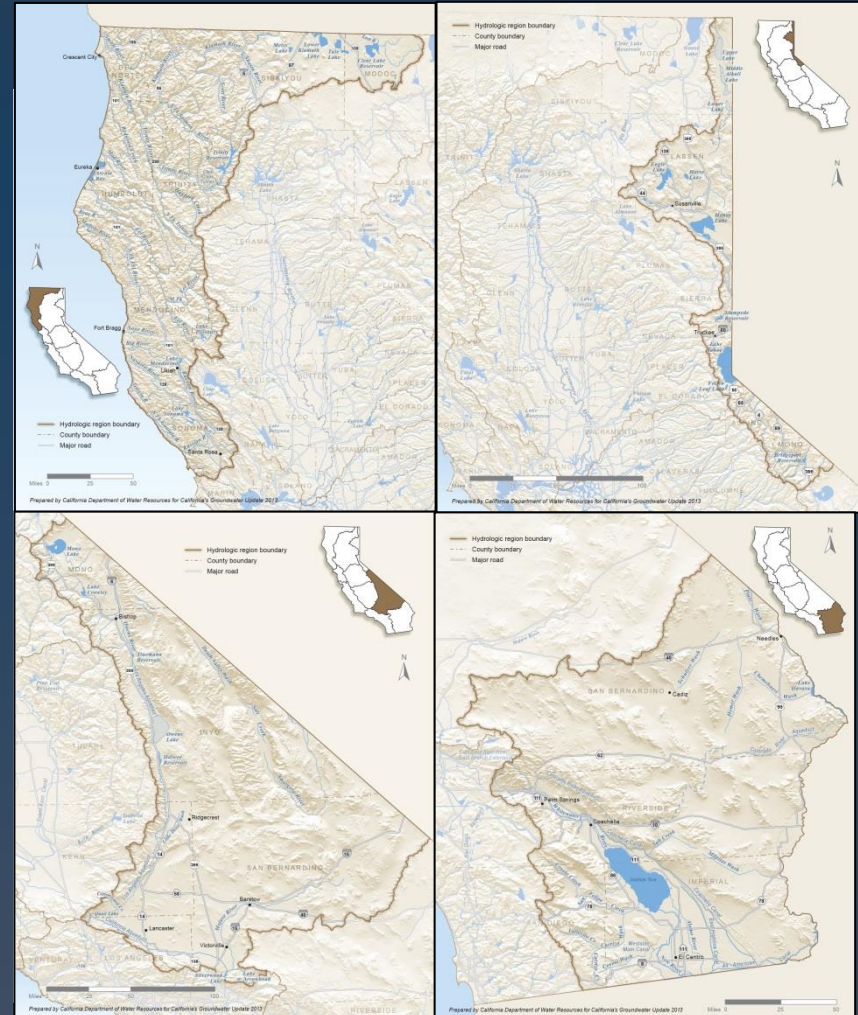
April 2015

State of California
Natural Resources Agency
Department of Water Resources

California's Groundwater Update 2013

Report Organization

- Findings, Data Gaps, and Recommendations
- Chapter 1 – Introduction, Scope, and Future Directions
- Chapter 2 – Statewide Update
- Chapter 3 – North Coast
- Chapter 4 – San Francisco Bay
- Chapter 5 – Central Coast
- Chapter 6 – South Coast
- Chapter 7 – Sacramento River
- Chapter 8 – San Joaquin River
- Chapter 9 – Tulare Lake
- Chapter 10 – North Lahontan
- Chapter 11 – South Lahontan
- Chapter 12 – Colorado River



California's Groundwater Update 2013

Report Organization

Technical Appendices

- Appendix A – Methods and Assumptions
- Appendix B – CASGEM Basin Prioritization
- Appendix C – Groundwater Use Data
- Appendix D – Conjunctive Management Survey Results
- Appendix E – Changes in Groundwater in Storage Data
- Appendix F – Land Subsidence





California's Groundwater Update 2013

A Comprehensive Report

1. Introduction

2. Findings, Data Gaps, and Recommendations

3. Groundwater Supply and Development

Alluvial Aquifers

Fractured-Rock Aquifers

Well Infrastructure ←

CASGEM Basin Prioritization ←

4. Groundwater Supply

Average Annual Groundwater Supply ←

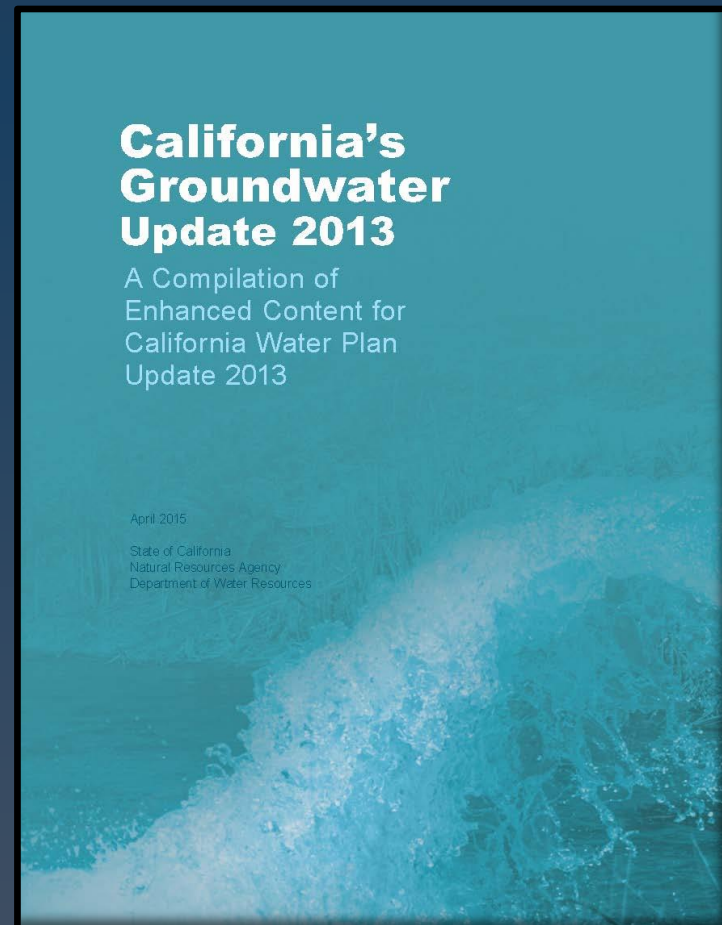
Change in Annual Groundwater Supply ←

5. Groundwater Monitoring Efforts

Groundwater Level Monitoring ←

Groundwater Quality Monitoring

Land Subsidence Monitoring

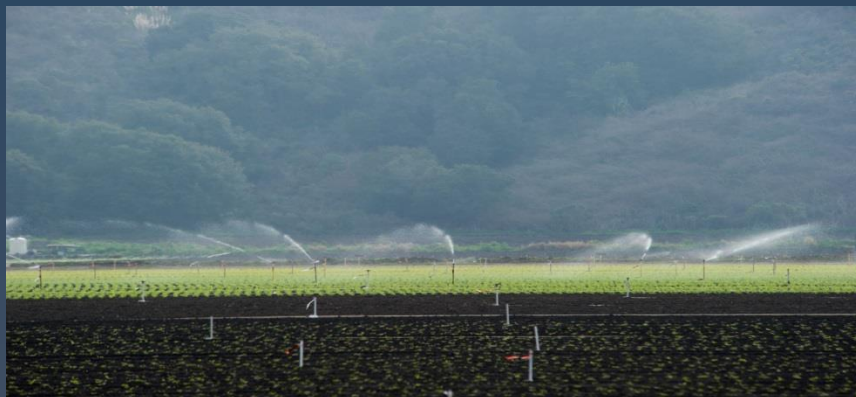


California's Groundwater Update 2013

A Comprehensive Report

6. Aquifer Conditions

- Depth to Groundwater
- Groundwater Elevations
- Change in Groundwater in Storage
- Groundwater Level Trends ←
- Groundwater Quality
- Land Subsidence



7. Groundwater Management

- GWMP Inventory ←
- GWMP Assessment ←
- Court Adjudications ←
- Groundwater Ordinances ←
- Special Act Districts
- Other Groundwater Management Planning Efforts

8. Conjunctive Management Inventory

- Conjunctive Management Inventory Results

9. References



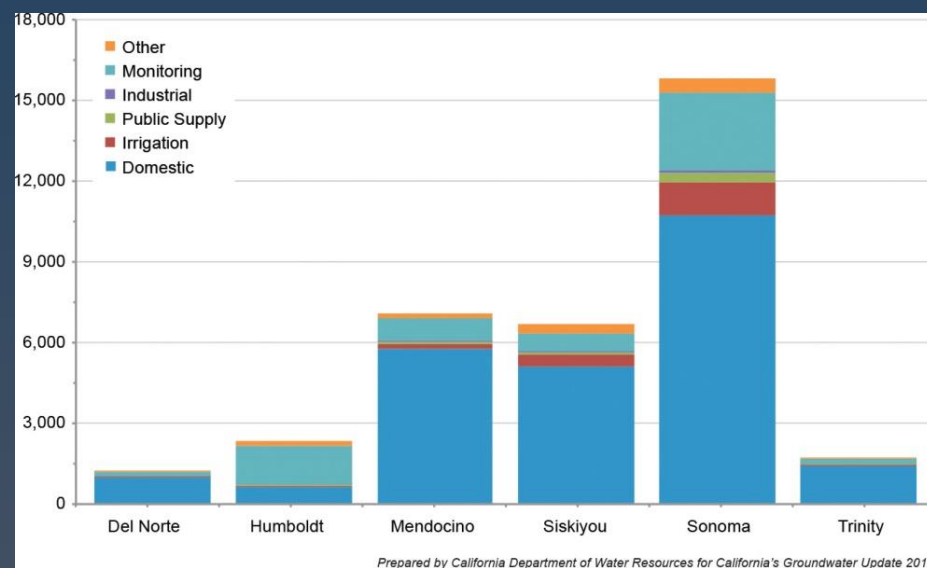
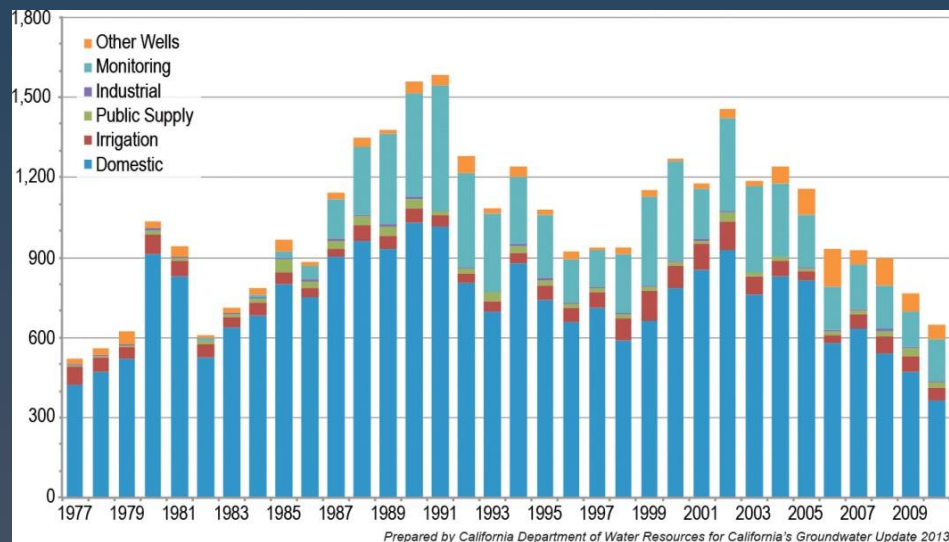
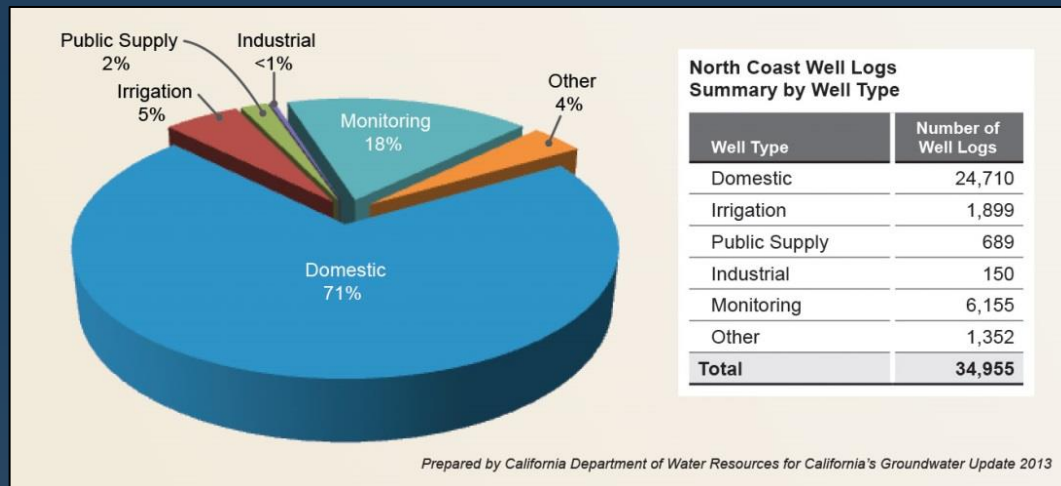
North Coast North Lahontan South Lahontan Colorado River



Well Infrastructure and Distribution

North Coast HR

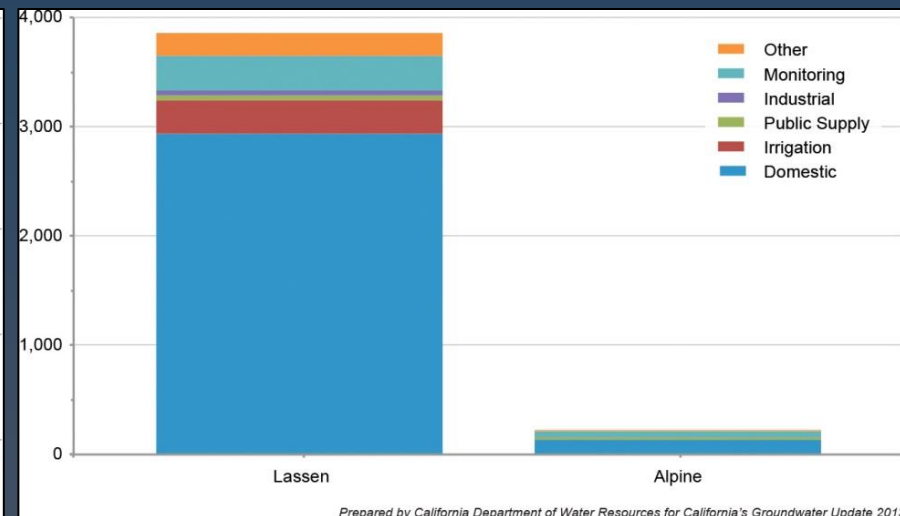
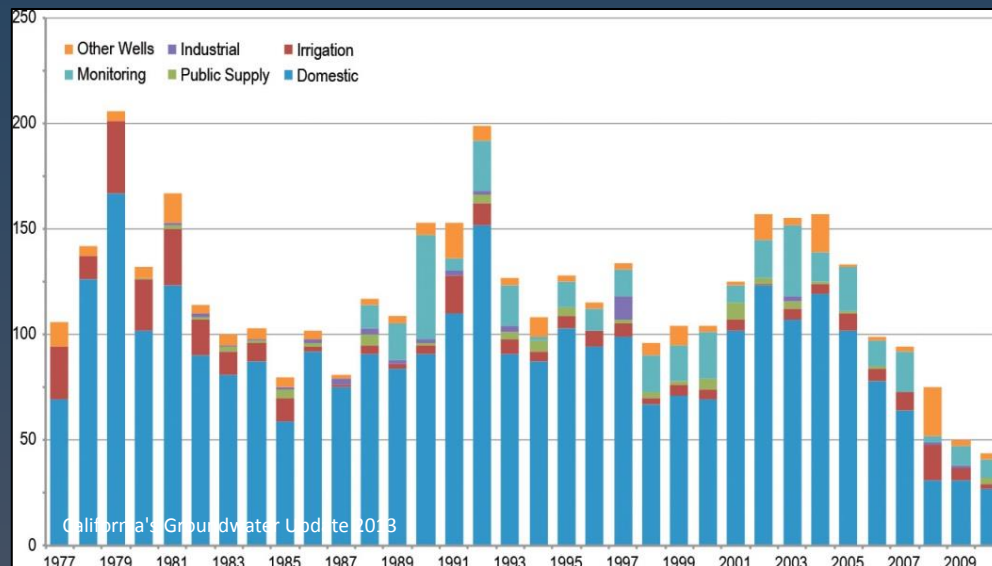
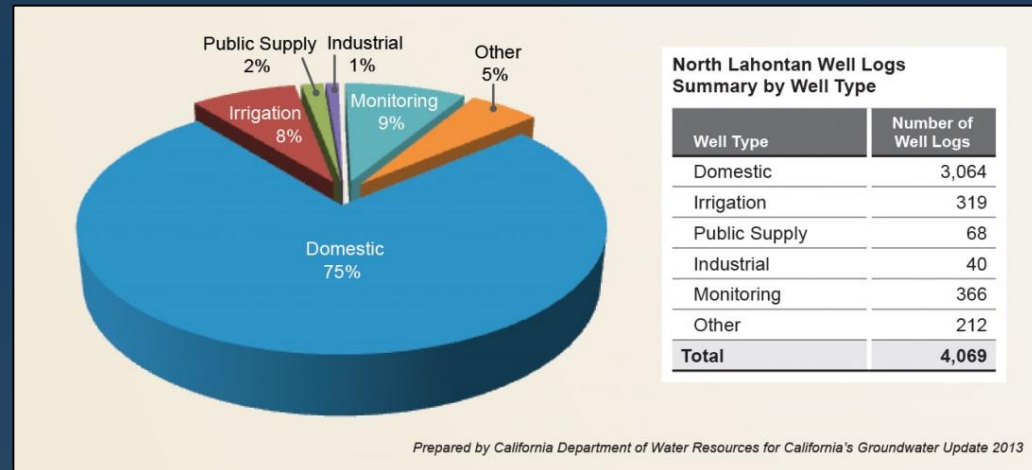
- 71% of wells are domestic wells
- Domestic well installation varies between dry and wet years
- Stable trend of irrigation wells
- Increased trend of monitoring wells due to UST investigations



Well Infrastructure and Distribution

North Lahontan HR

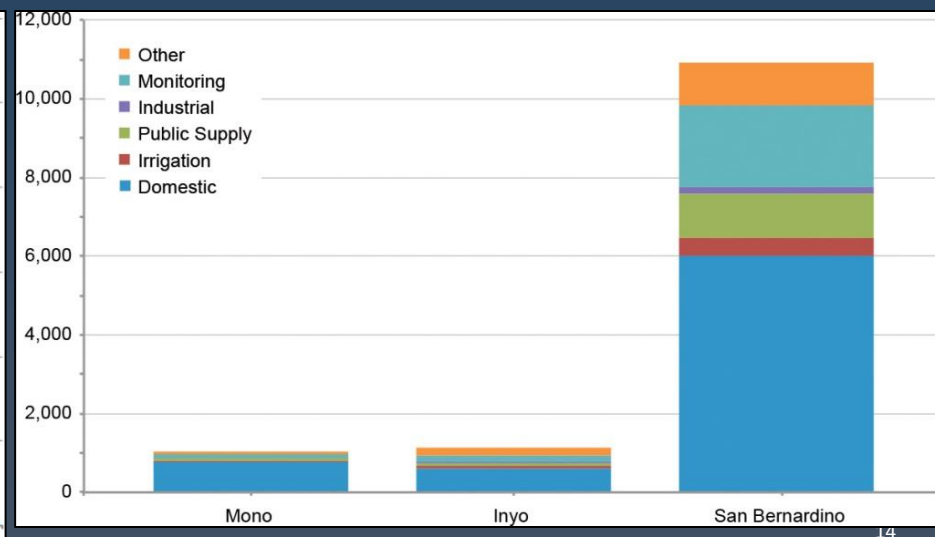
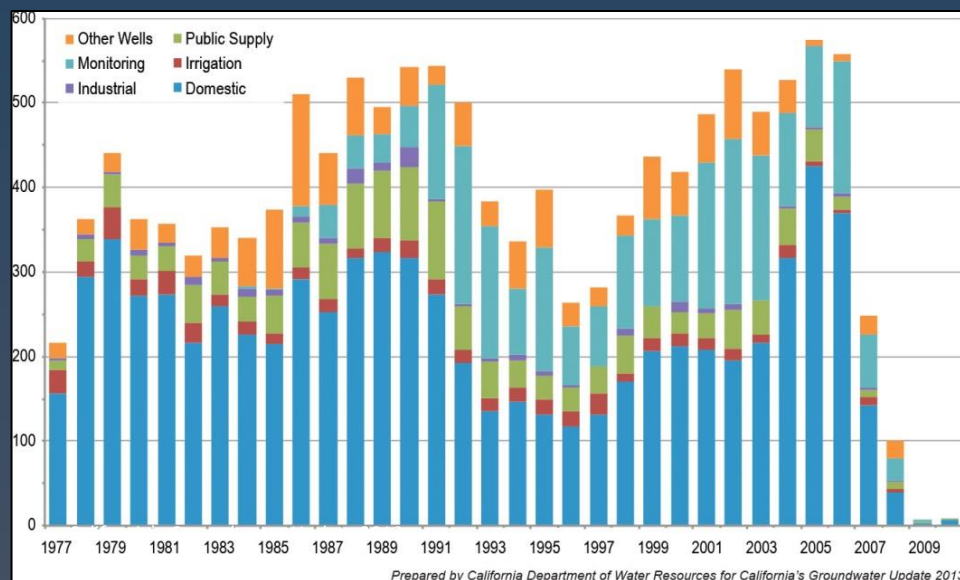
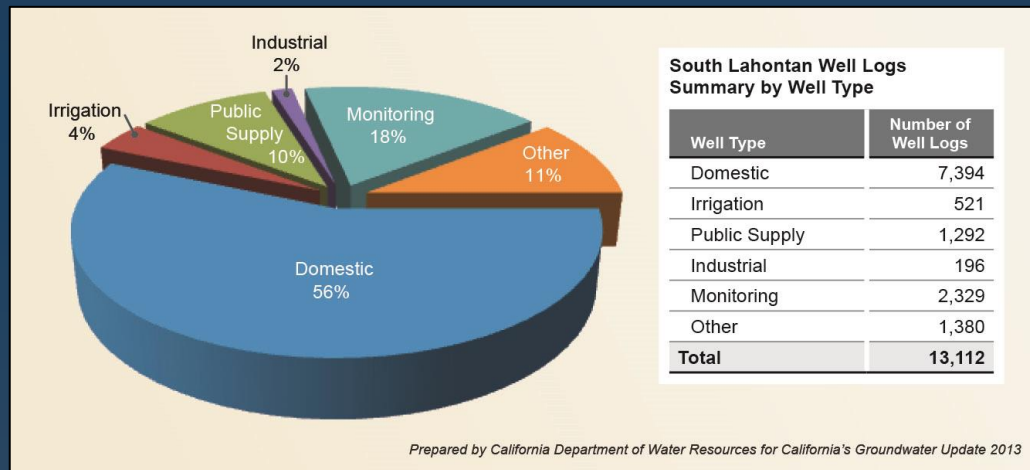
- Majority of well are located in Lassen County
- 211 wells recorded in Alpine County
- Domestic wells account for 76% in Lassen and 63% in Alpine
- Fewest wells of all HRs



Well Infrastructure and Distribution

South Lahontan HR

- 83% of wells are in San Bernardino County
- 56% are domestic wells
- Monitoring wells – increased from 39 wells in 1987 to 195 in 2002

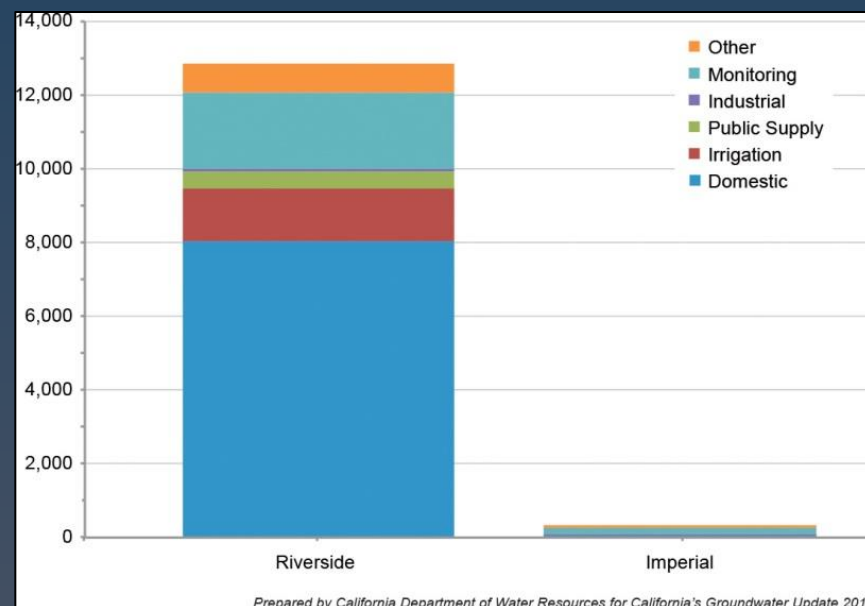
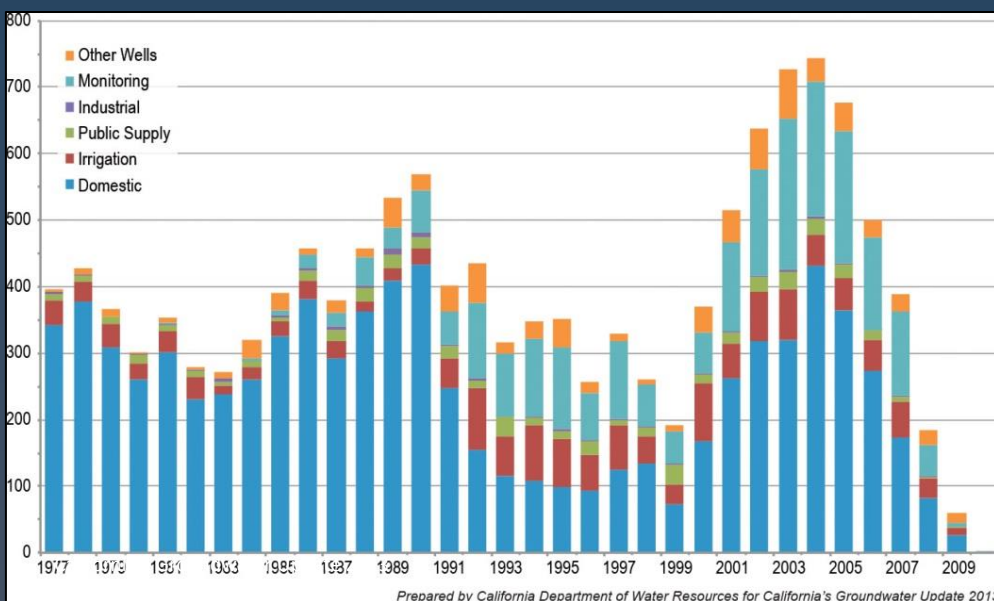
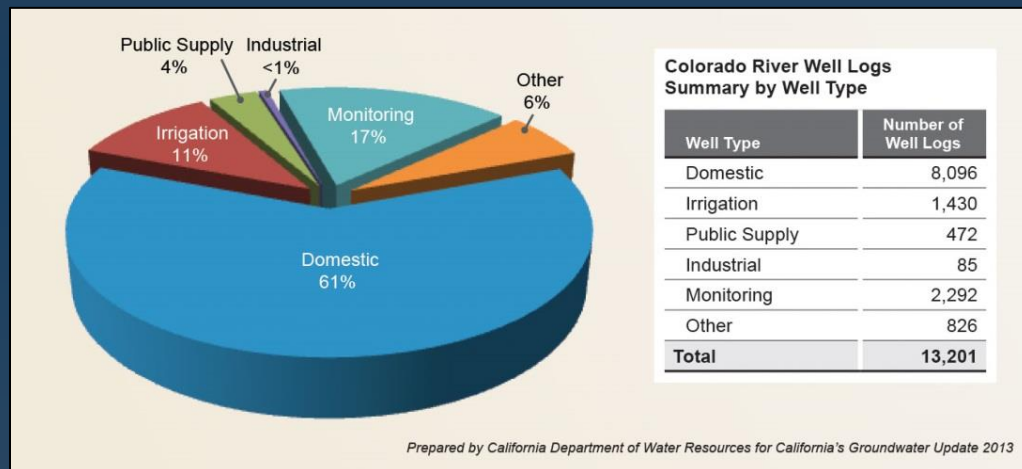




Well Infrastructure and Distribution

Colorado River HR

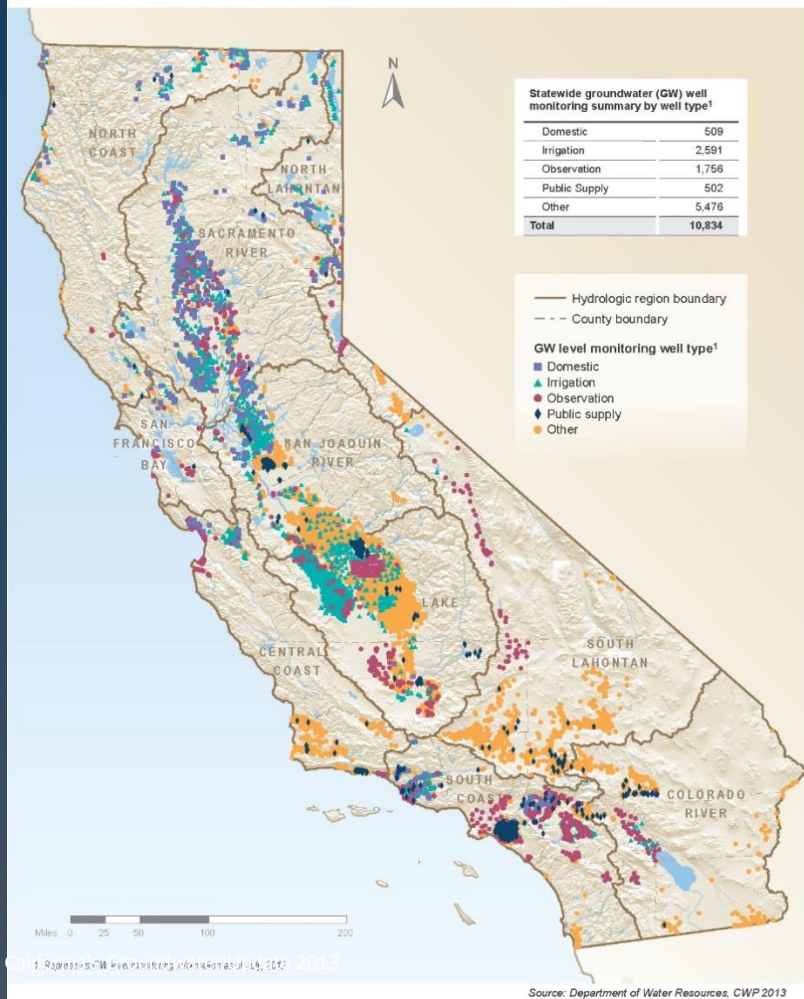
- 97% of wells are in Riverside County
- Imperial County has extensive surface water supplies from Colorado River via All-American Canal
- 60% of wells in Imperial County are monitoring wells
- 20% in Imperial County are “other”



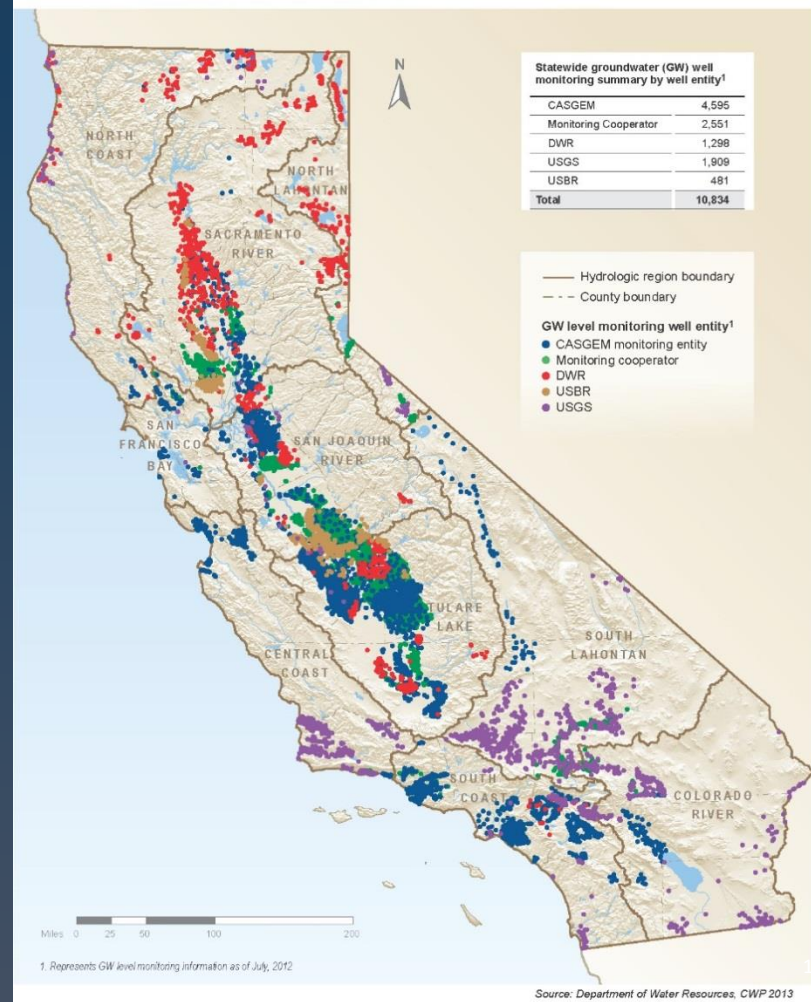
Groundwater Level Monitoring Wells Statewide



California Groundwater Level Monitoring Wells by Type

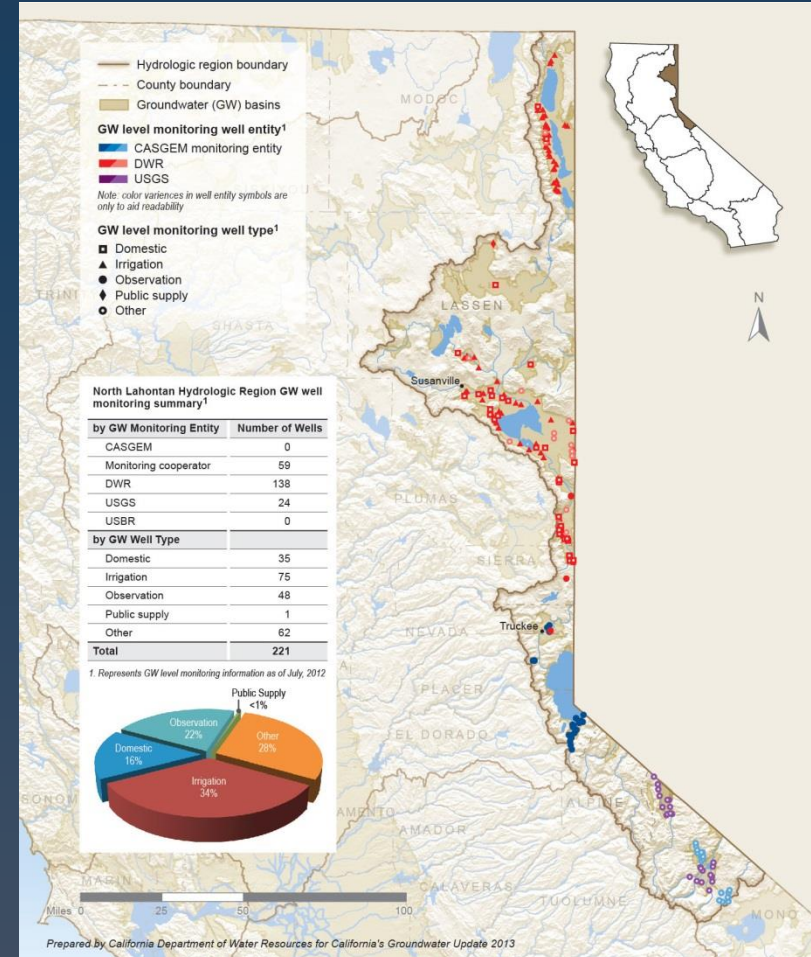
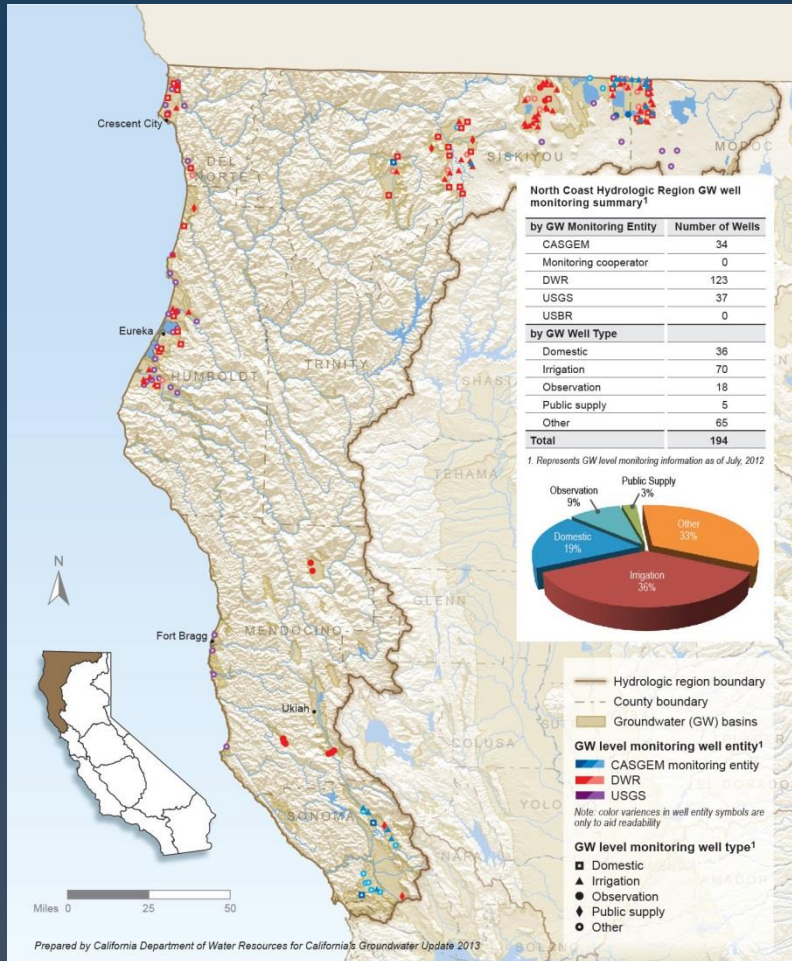


California Groundwater Level Monitoring Wells by Entity



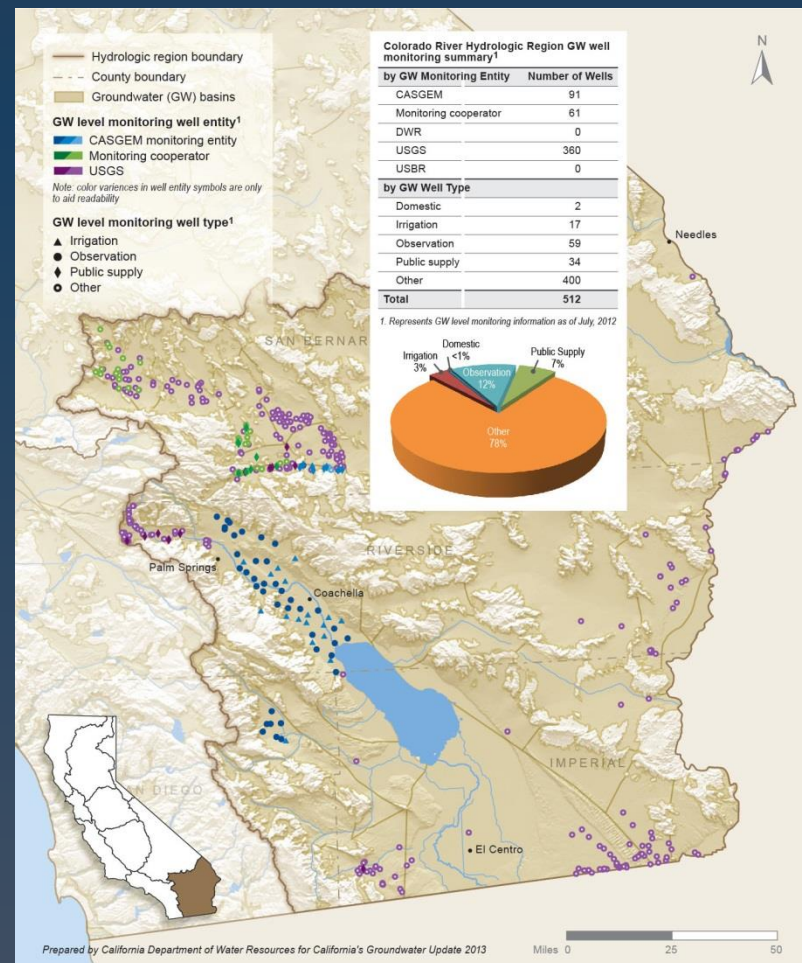
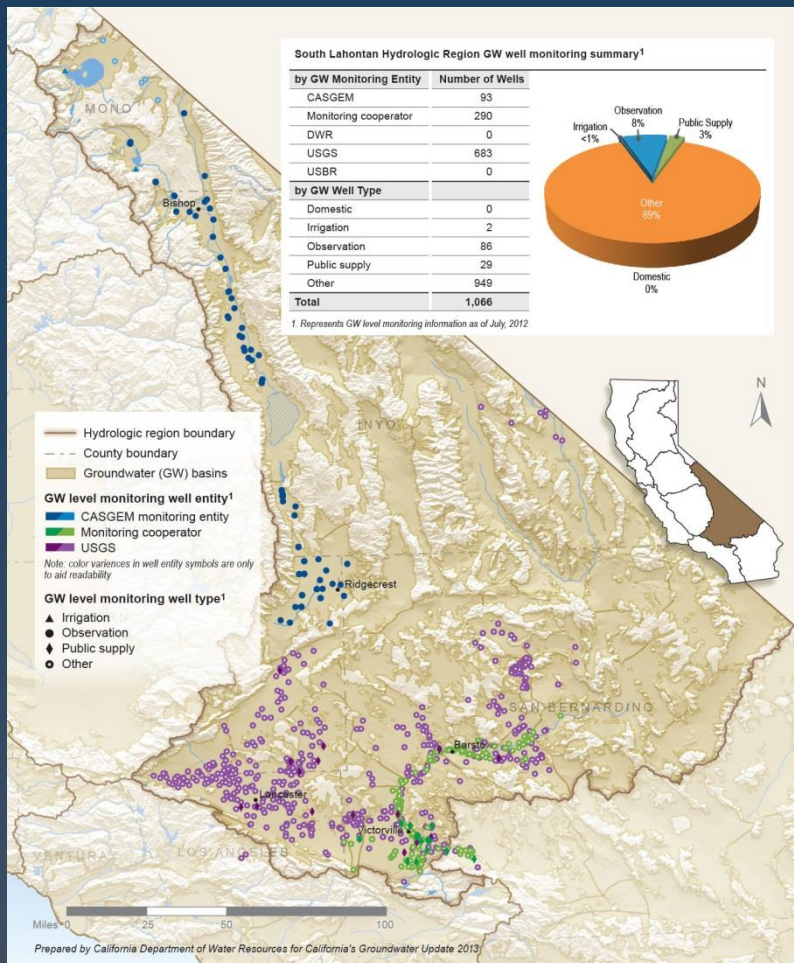
Groundwater Level Monitoring Wells

North Coast and North Lahontan HRs



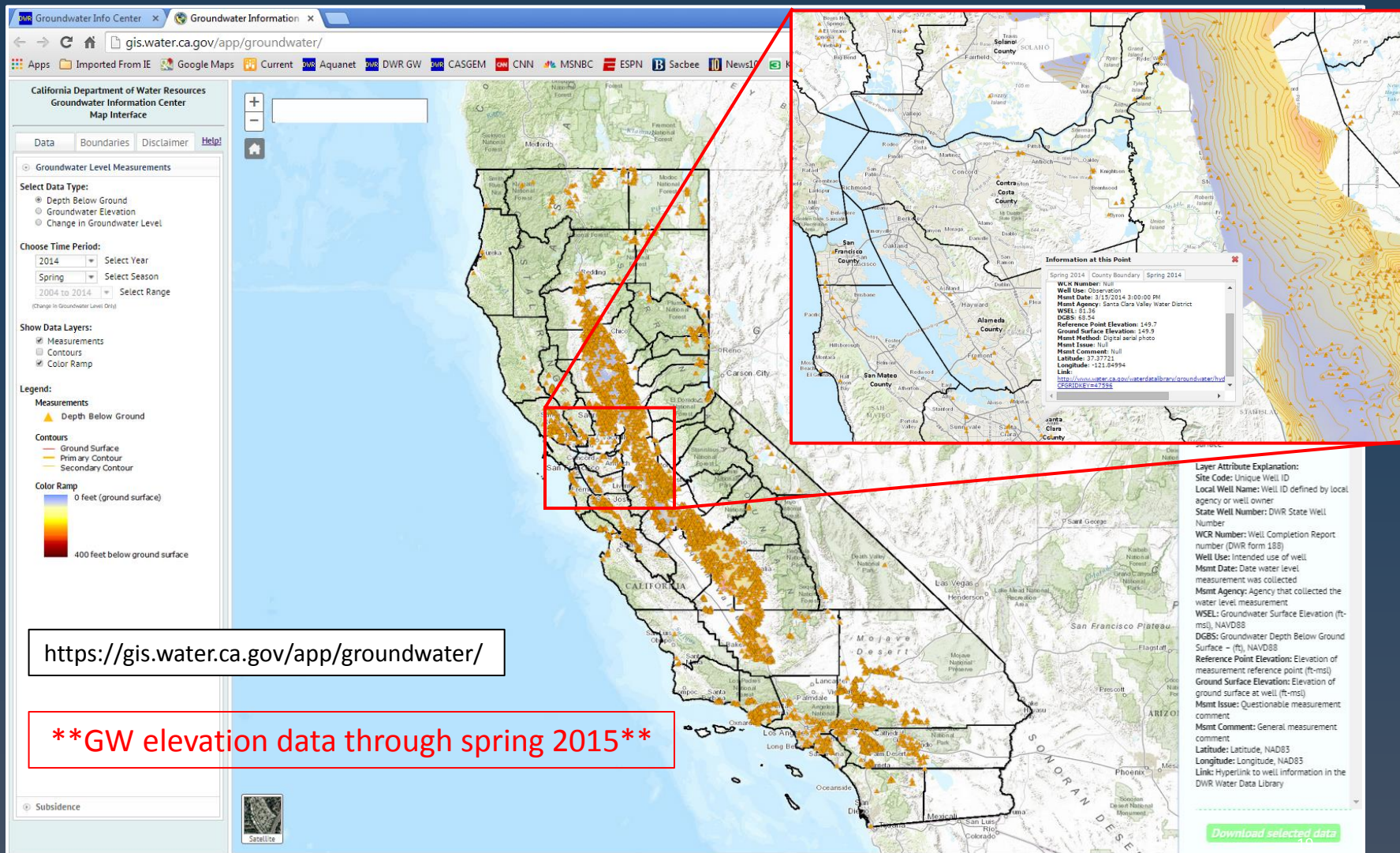
Groundwater Level Monitoring Wells

South Lahontan and Colorado River HRs





Groundwater Information Center GIS Map Interface – GW Level Data

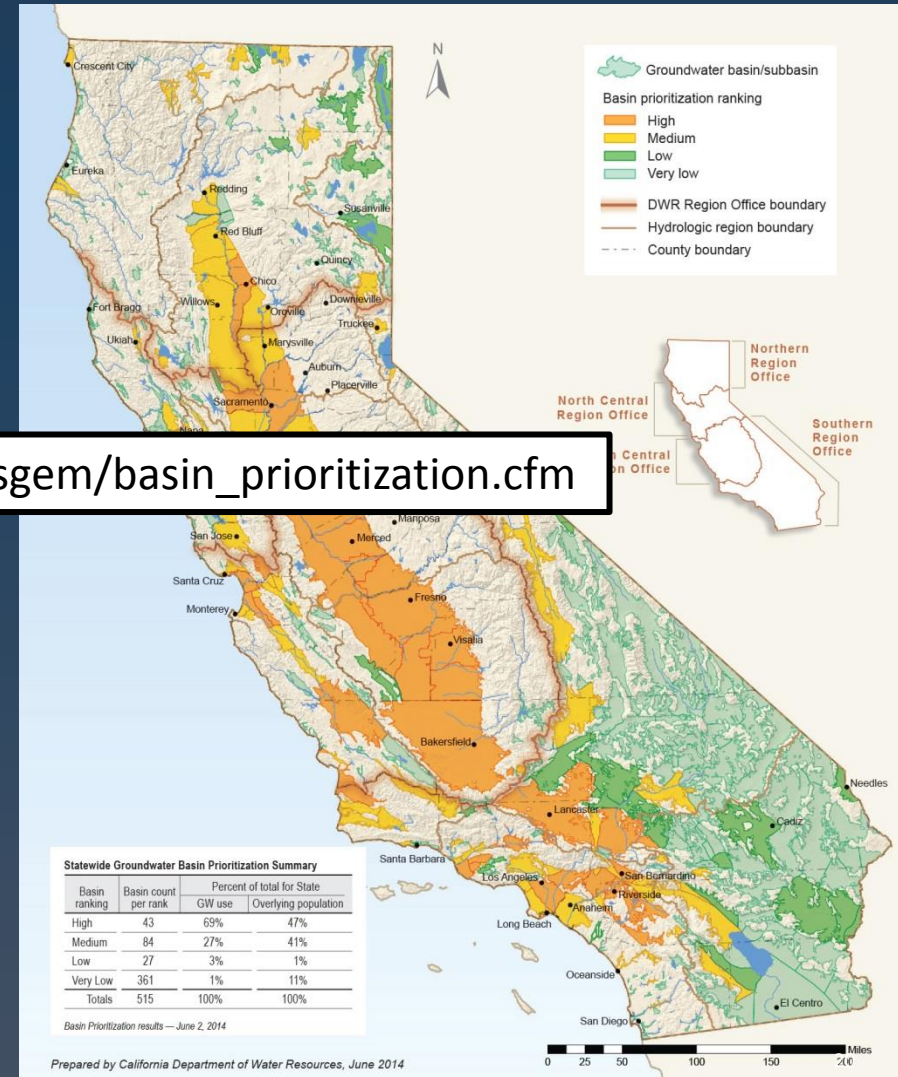


CASGEM Basin Prioritization Statewide



- 515 alluvial basins/subbasins
- 127 high & medium priority basins account for:
 - 96% of average annual GW use
 - 88% of 2010 population overlying basin
- 27 low & 361 very low priority basins account for:
 - 4% of average annual GW use
 - 12% of 2010 population overlying basin area

http://water.ca.gov/groundwater/casgem/basin_prioritization.cfm

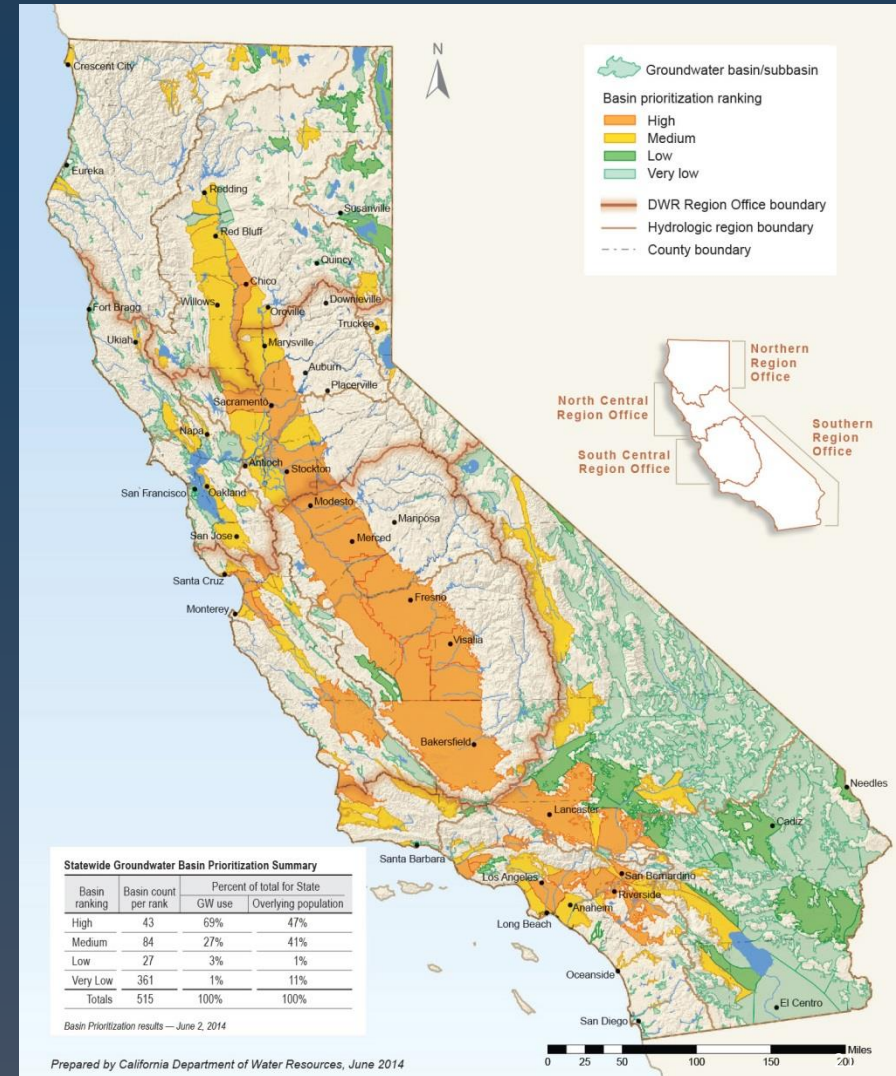


CASGEM Basin Prioritization Statewide



California Water Code Section 10933(b):

- The population overlying the basin.
- The rate of current and projected growth of the population.
- The number of public supply wells.
- The total number of wells.
- The irrigated acreage.
- The degree to which persons rely on groundwater as their primary source of water.
- Any documented impacts on the groundwater, including overdraft, subsidence, saline intrusion, and other water quality degradation.
- Any other information determined to be relevant by the Department, **including adverse impacts on local habitat and local stream flows.**



Basin Prioritization

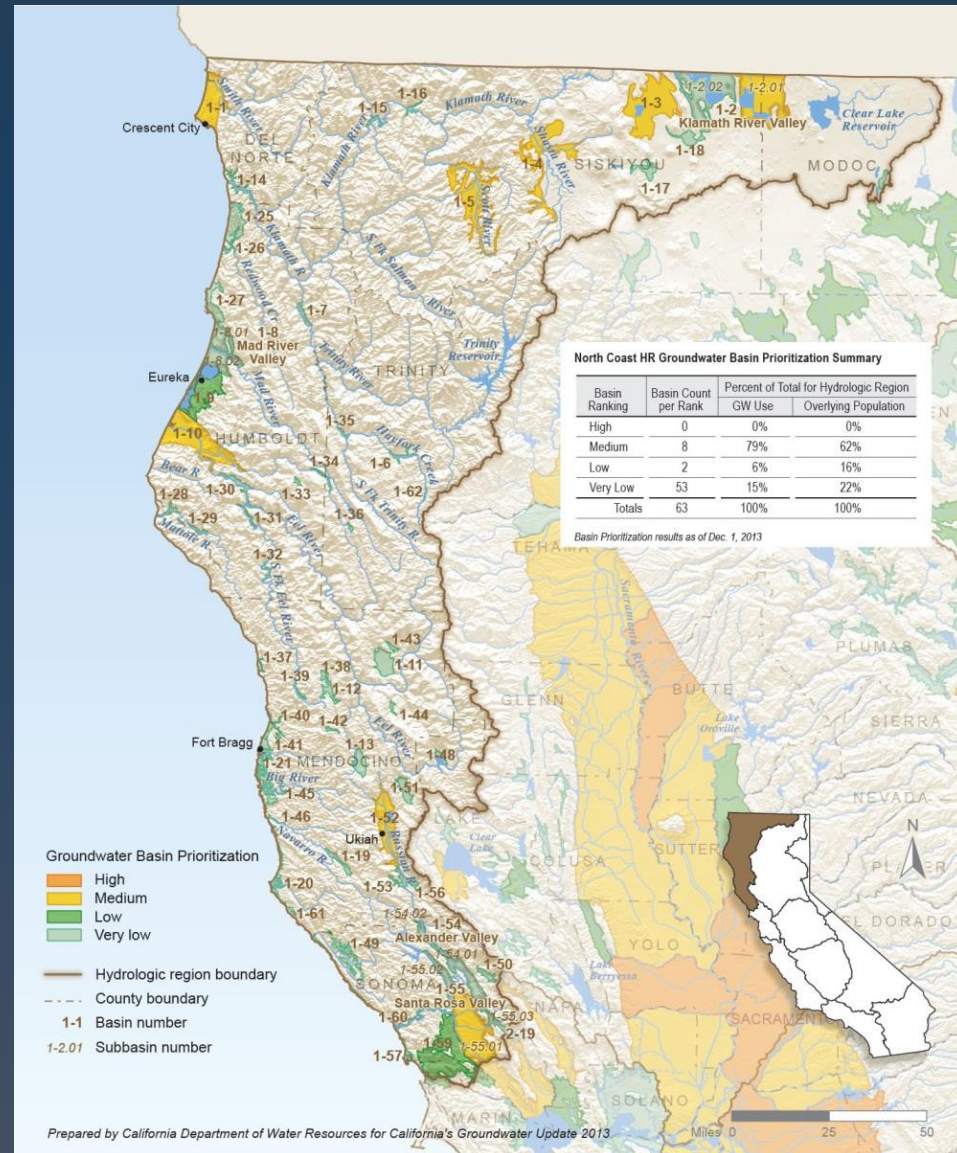
North Coast HR

- December 2013 Basin Priorities:

- High 0
- Medium 8
- Low 2
- Very Low 63

- High and Medium GW Use 79%

- High and Medium Population 62%



Basin Prioritization

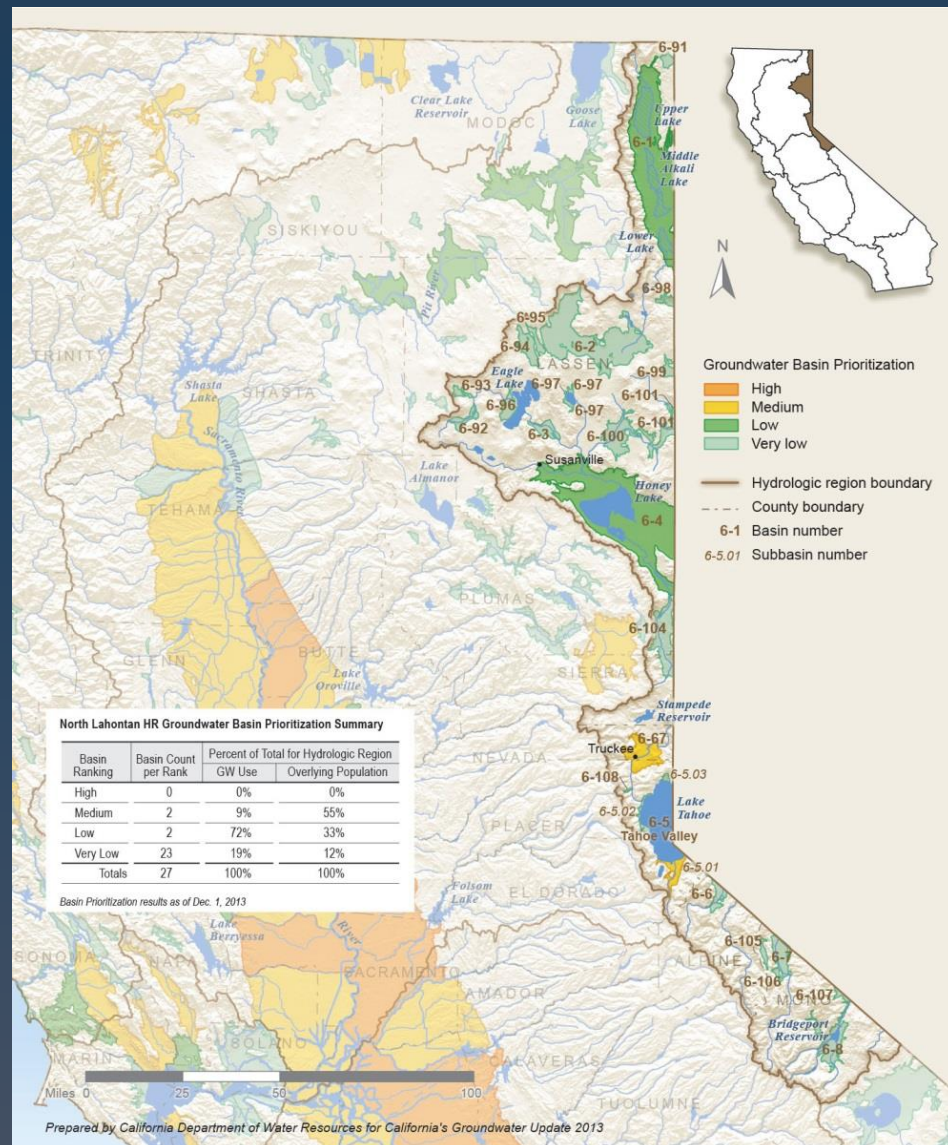
North Lahontan HR



- December 2013 Basin Priorities:

- High 0
- Medium 2
- Low 2
- Very Low 23

- High and Medium GW Use 9%
- High and Medium Population 55%





Basin Prioritization

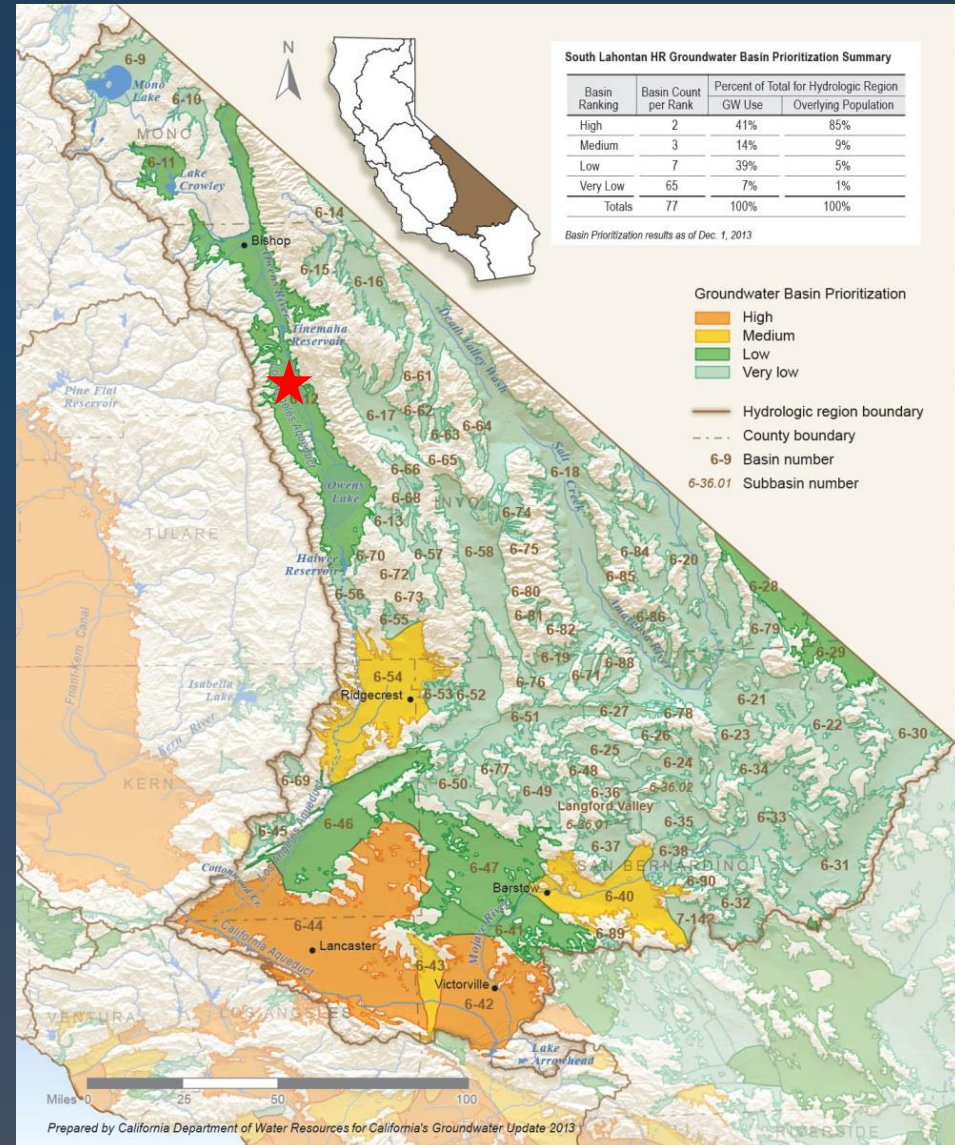
South Lahontan HR

- December 2013 Basin Priorities:

- High 2
- Medium 3 (4)
- Low 7
- Very Low 65

- High and Medium GW Use 55%

- High and Medium Population 94%



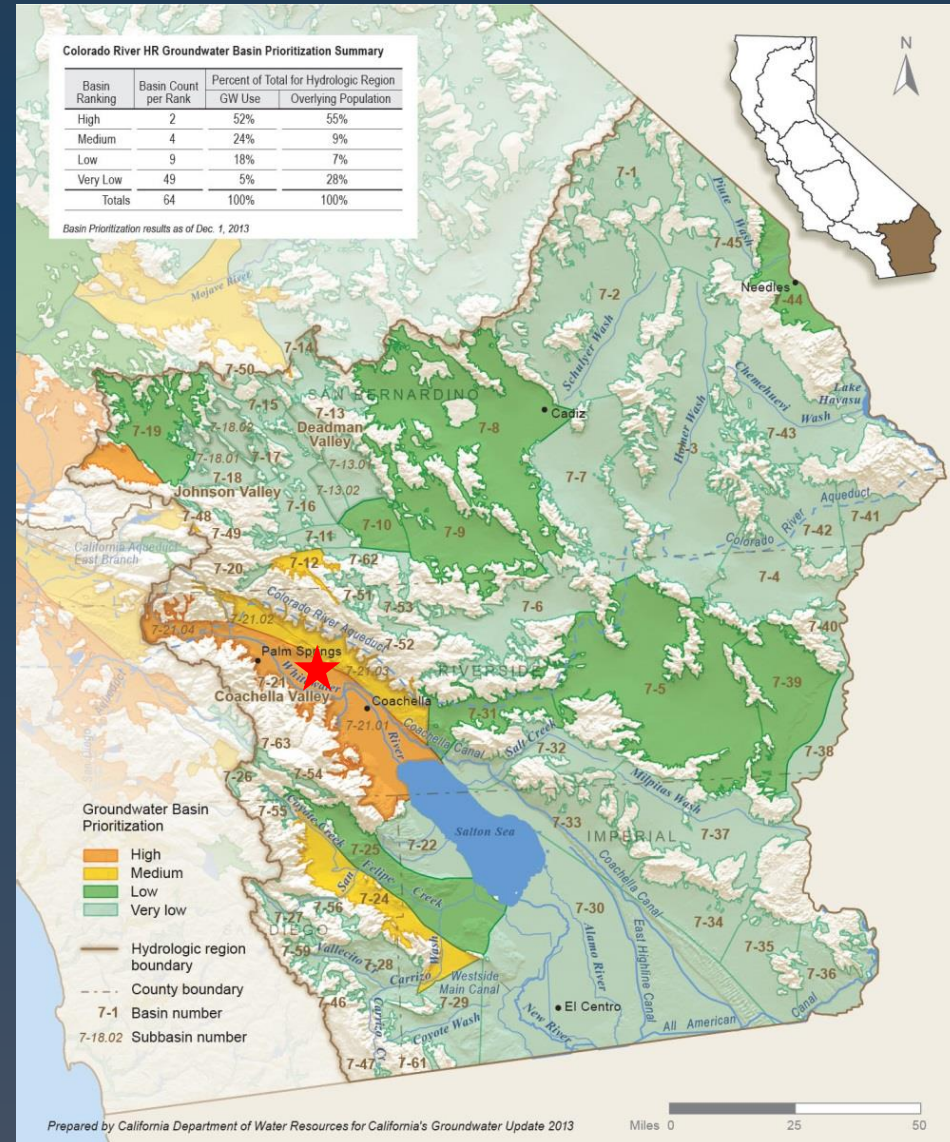
Basin Prioritization Colorado River HR

- December 2013 Basin Priorities:

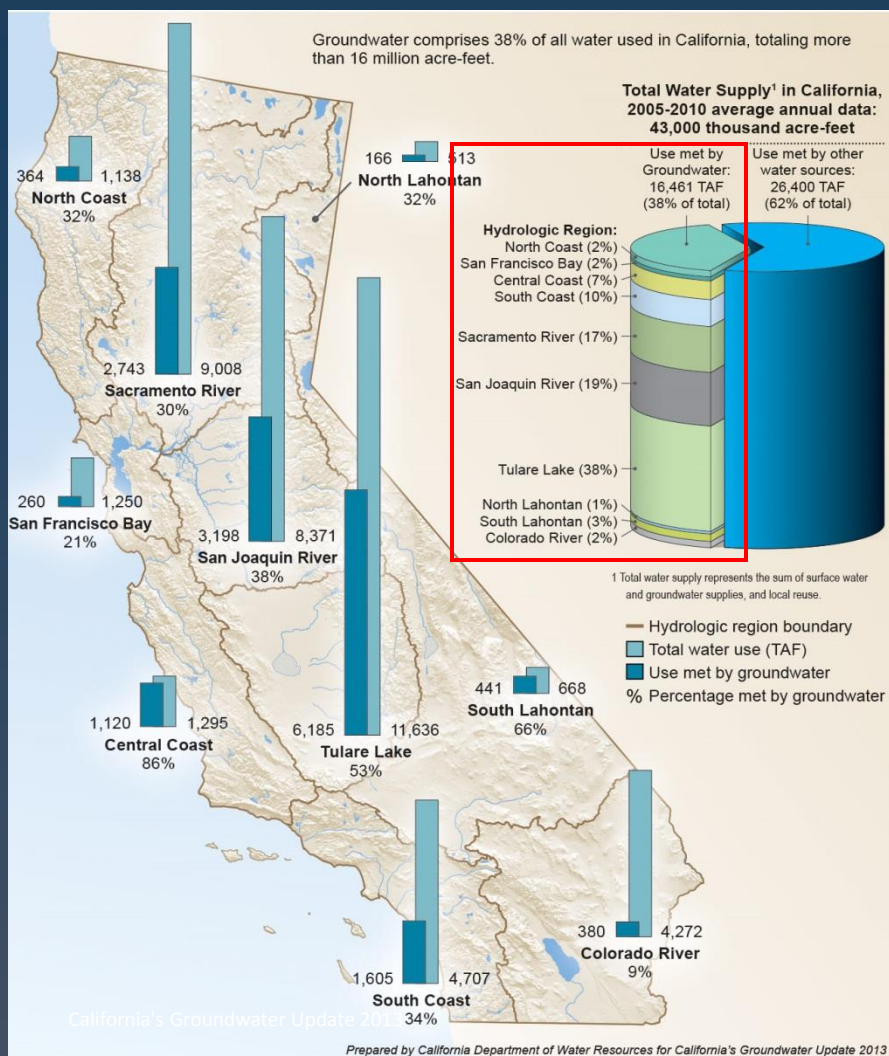
- High 2
- Medium 4
- Low 9
- Very Low 49

- High and Medium GW Use 76%

- High and Medium Population 64%



Groundwater Use Data 2005-2010 Average



Total Water Supply

- 43 maf (43,000 taf)

Groundwater Use

- 16.5 maf (16,461 taf)
- 38% of total supply

- GW Meets 39% of Total Agricultural Use
- GW Meets 41% of Total Urban Use

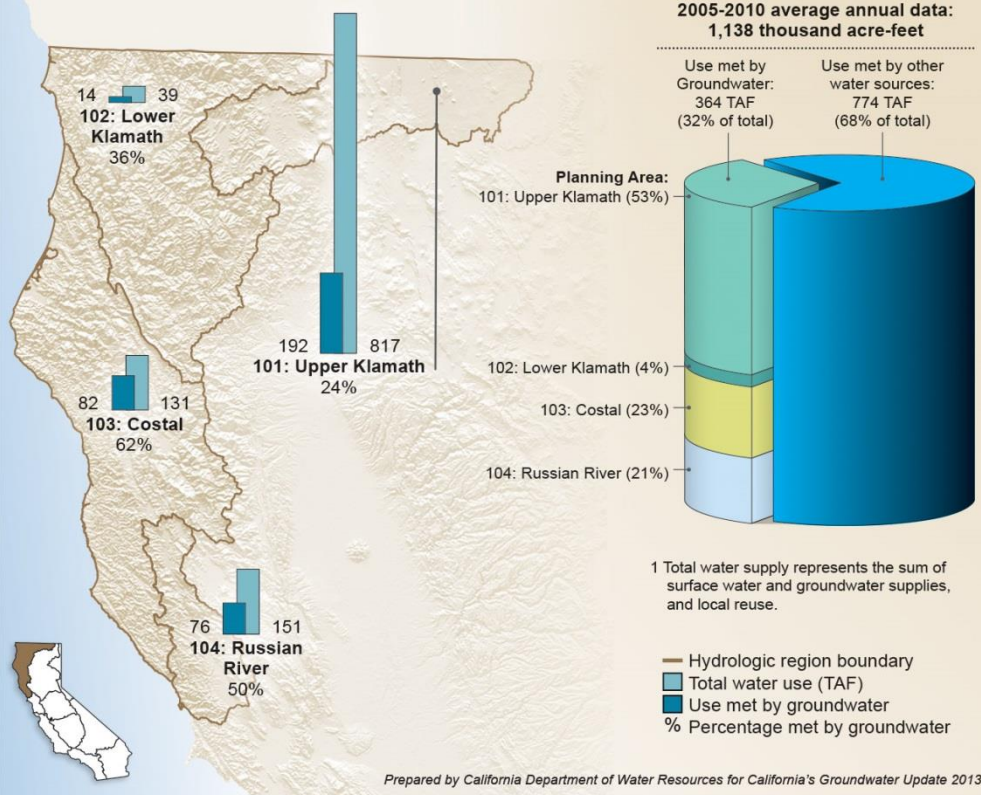
Average Annual Groundwater Use and Percent of Total Supply Met by Groundwater, by Hydrologic Region and by Type of Use (2005-2010)

Hydrologic Region	Agriculture Use Met by Groundwater		Urban Use Met by Groundwater		Managed Wetlands Use Met by Groundwater		Total Water Use Met by Groundwater	
	taf	%	taf	%	taf	%	taf	%
North Coast	301.3	41%	60.3	41%	2.5	1%	364.0	32%
San Francisco	76.1	74%	183.5	16%	0.0	0%	259.5	21%
Central Coast	906.1	91%	213.3	71%	0.0	0%	1,119.5	86%
South Coast	385.4	54%	1,219.6	31%	0.0	0%	1,605.0	34%
Sacramento River	2,294.2	30%	428.6	47%	20.1	4%	2,742.9	30%
San Joaquin	2,591.8	36%	415.9	58%	190.7	38%	3,198.4	38%
Tulare Lake	5,551.8	51%	604.0	82%	28.9	37%	6,184.8	53%
North Lahontan	118.4	27%	37.1	84%	10.7	48%	166.2	32%
South Lahontan	270.6	72%	170.3	58%	0.0	0%	440.9	66%
Colorado River	50.1	1%	329.7	53%	0.0	0%	379.7	9%
2005-2010 annual average California total:	12,545.7	39%	3,662.2	41%	252.9	18%	16,460.8	38%

Groundwater Supply (2005-2010)

North Coast HR

Groundwater comprises 32% of all water used in the North Coast hydrologic region, totaling more than 364 thousand acre-feet.



Total Water Supply

- 1,138 taf

Use Met by Surface Water

- 774 taf
- 68% of total supply

Use Met by Groundwater

- 364 taf
- 32% of total supply

Groundwater Supply (2005-2010)

North Lahontan HR

Groundwater comprises 32% of all water used in the North Lahontan hydrologic region, totaling more than 166 thousand acre-feet.

Total Water Supply¹ in the North Lahontan hydrologic region, 2005-2010 average annual data: 513 thousand acre-feet

Use met by Groundwater: 166 TAF (32% of total)
Use met by other water sources: 347 TAF (68% of total)

Planning Area:
801: Lassen (89%)

802: Alpine (11%)

¹ Total water supply represents the sum of surface water and groundwater supplies, and local reuse.

— Hydrologic region boundary
■ Total water use (TAF)
■ Use met by groundwater
% Percentage met by groundwater

Prepared by California Department of Water Resources for California's Groundwater Update 2013

Total Water Supply

- 513 taf

Use Met by Surface Water

- 347 taf
- 68% of total supply

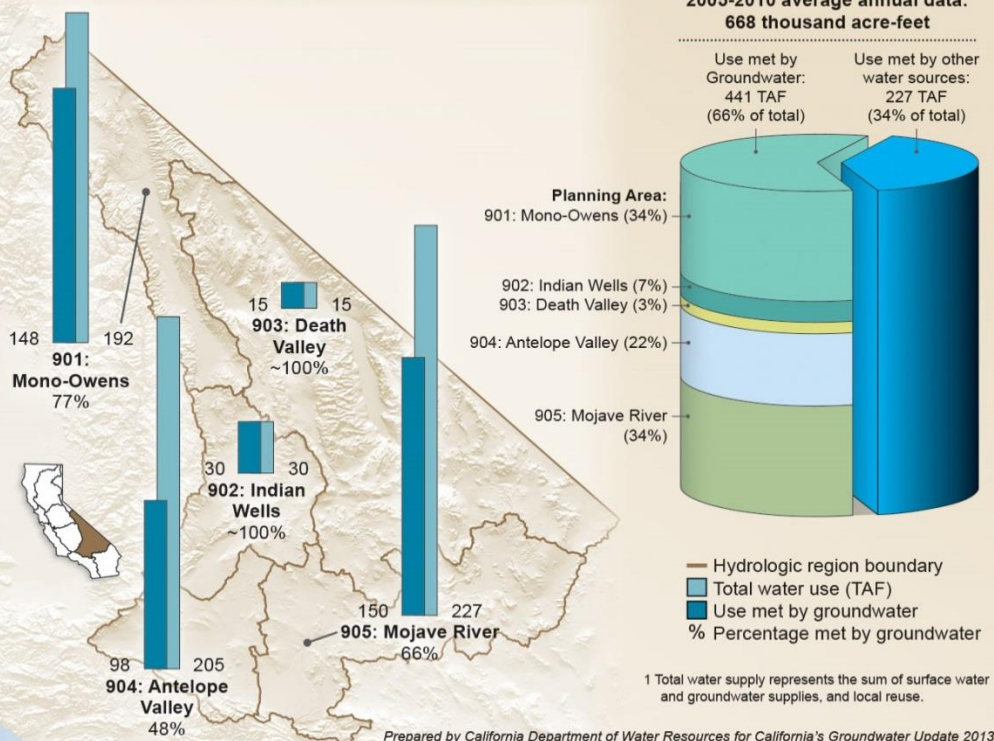
Use Met by Groundwater

- 166 taf
- 32% of total supply

Groundwater Supply (2005-2010)

South Lahontan HR

Groundwater comprises 66% of all water used in the South Lahontan hydrologic region, totaling more than 441 thousand acre-feet.



Total Water Supply

- 668 taf

Use Met by Surface Water

- 227 taf
- 34% of total supply

Use Met by Groundwater

- 441 taf
- 66% of total supply

Groundwater Supply (2005-2010)

Colorado River HR

Total Water Supply

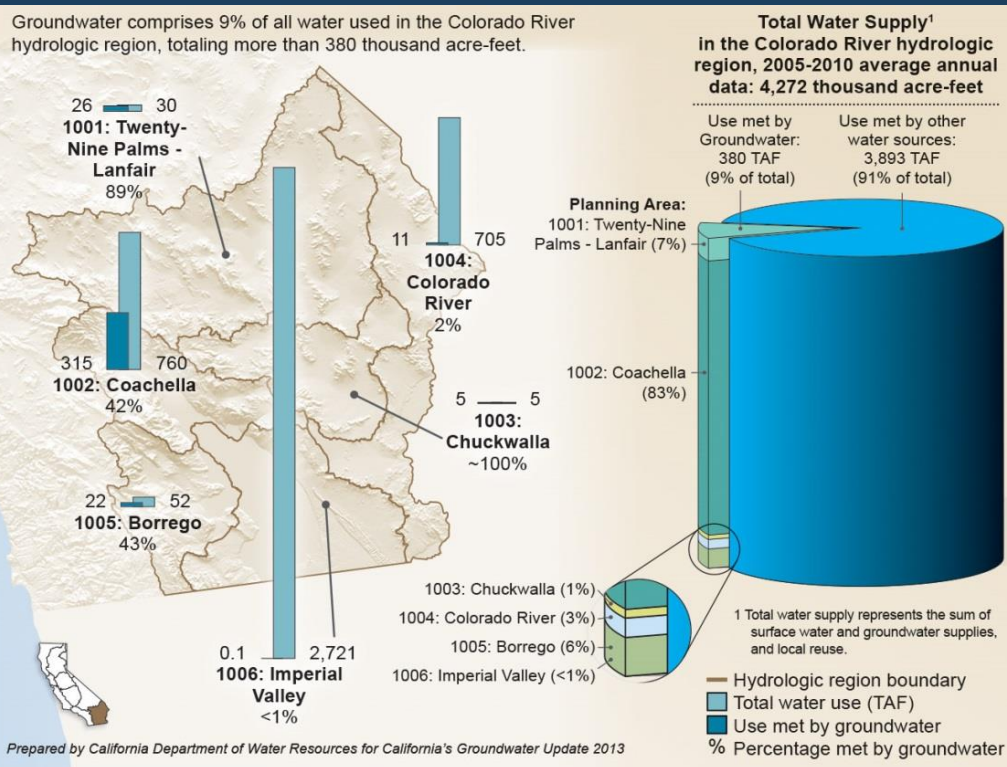
- 4,272 taf

Use Met by Surface Water

- 3,893 taf
- 91% of total supply

Use Met by Groundwater

- 380 taf
- 9% of total supply





Water Supply Trend (2002-2010)

Statewide

Water Year (% Precipitation)

Blue = groundwater

Green = surface water

Yellow = reuse water

Right Side:

Total Water Used by Supply

Left Side:

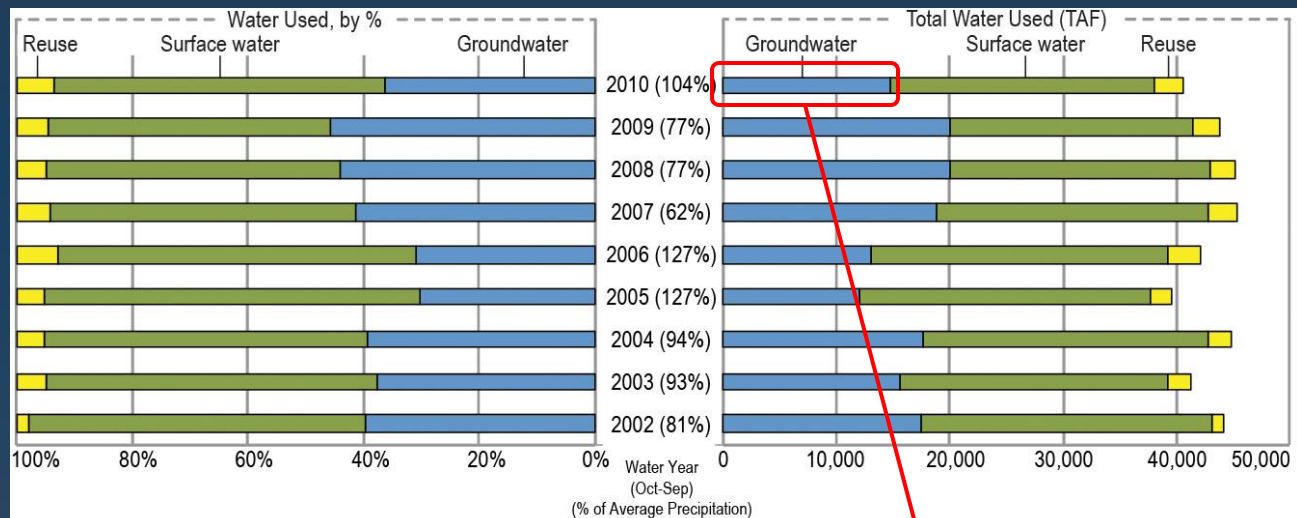
Water Used by Percent by Supply

Water Year (% Precipitation)

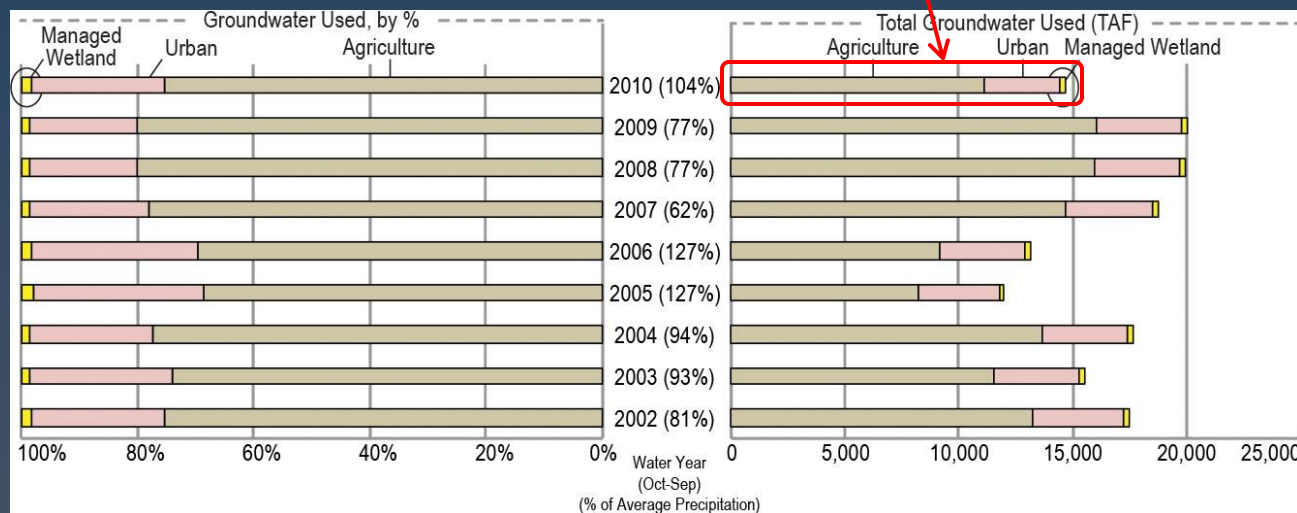
Brown = agriculture

Pink = urban

Yellow = managed wetlands



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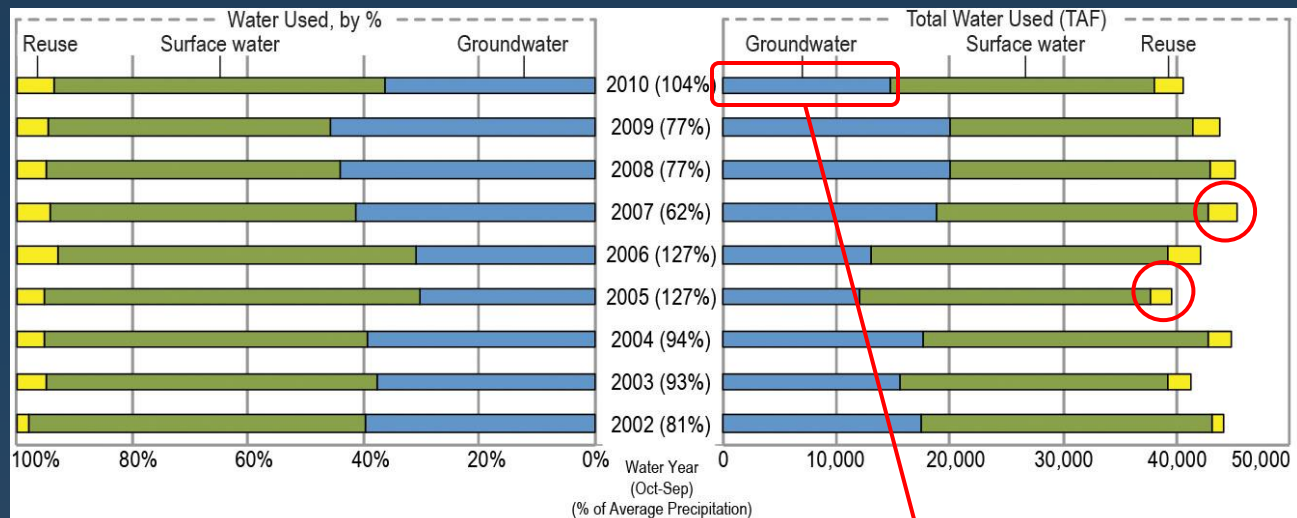
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Water Supply Trend (2002-2010) Statewide

TOTAL WATER SUPPLY

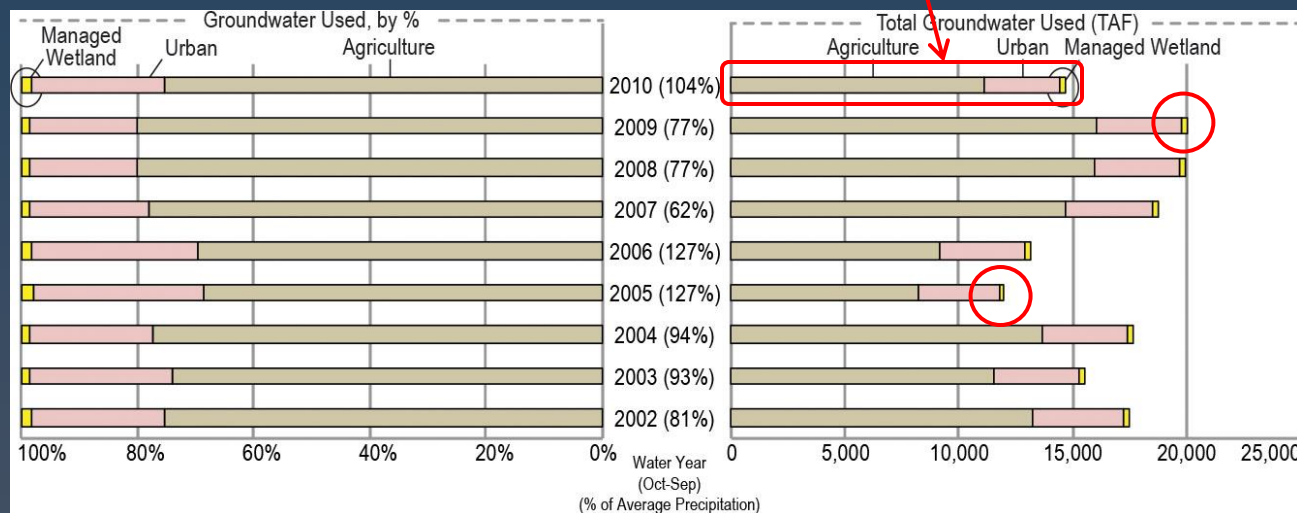
- High of 45.5 maf
 - 2007 (62%)
- Low of 39.7 maf
 - 2005 (127%)



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GROUNDWATER SUPPLY

- High of 20.1 maf
 - 2009 (77%)
 - 46% of total supply
- Low of 12 maf
 - 2005 (127%)
 - 30% of total supply



Prepared by California Department of Water Resources for California's Groundwater Update 2013



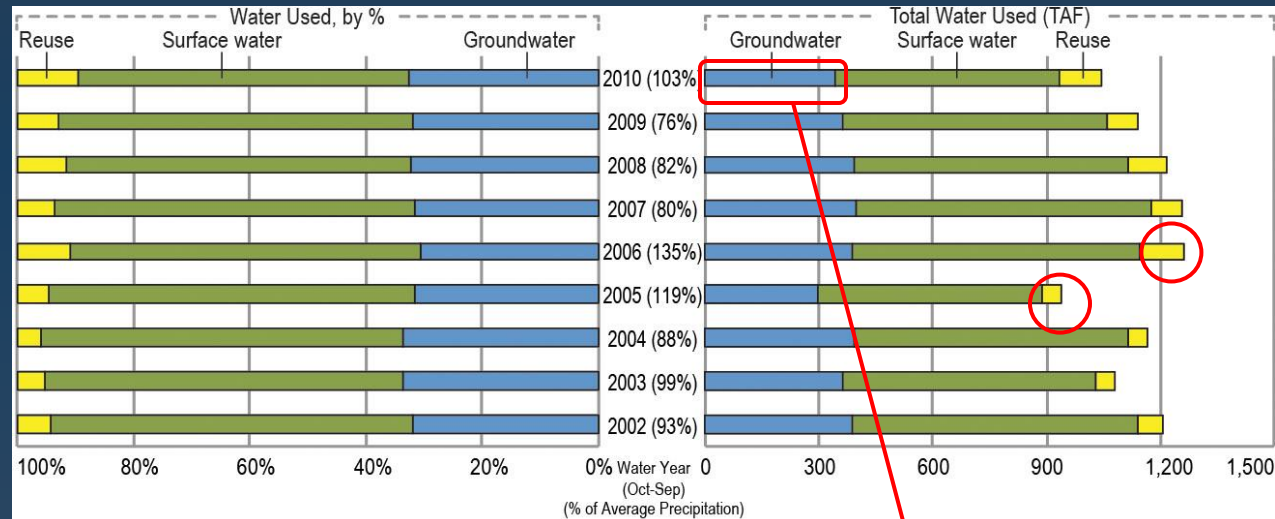
Water Supply Trend (2002-2010)

North Coast HR

TOTAL WATER SUPPLY

- High of 1,262 taf
 - 2006 (135%)
- Low of 939 taf
 - 2005 (119%)

GW meets 31-34% of total supply

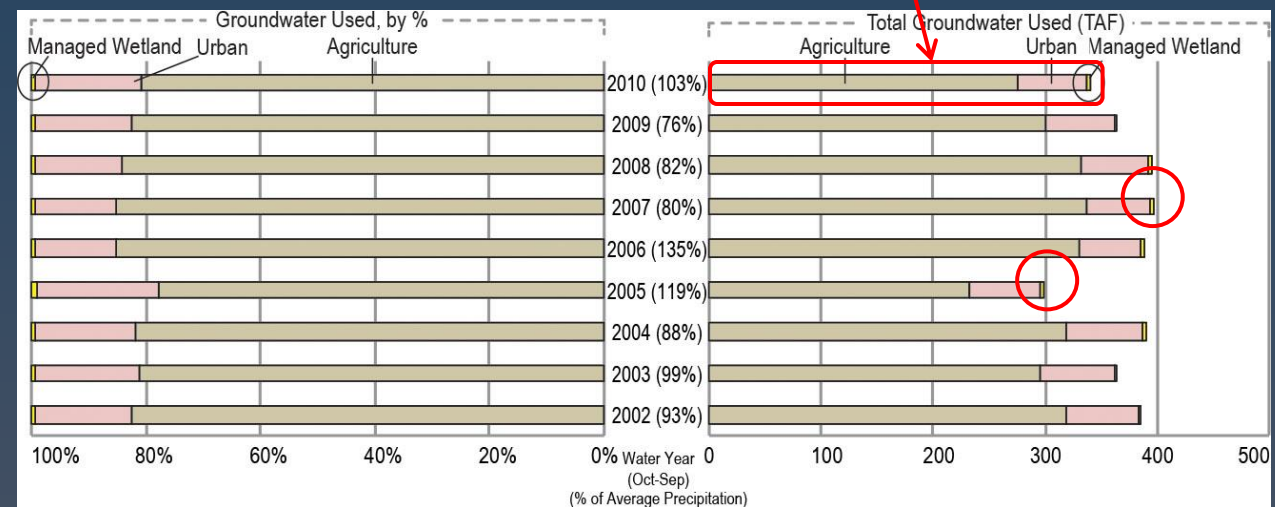


Prepared by California Department of Water Resources for California's Groundwater Update 2013

GROUNDWATER SUPPLY

- High of 398 taf
 - 2007 (80%)
- Low of 298 taf
 - 2005 (119%)

78-85% of GW for agricultural use



Prepared by California Department of Water Resources for California's Groundwater Update 2013



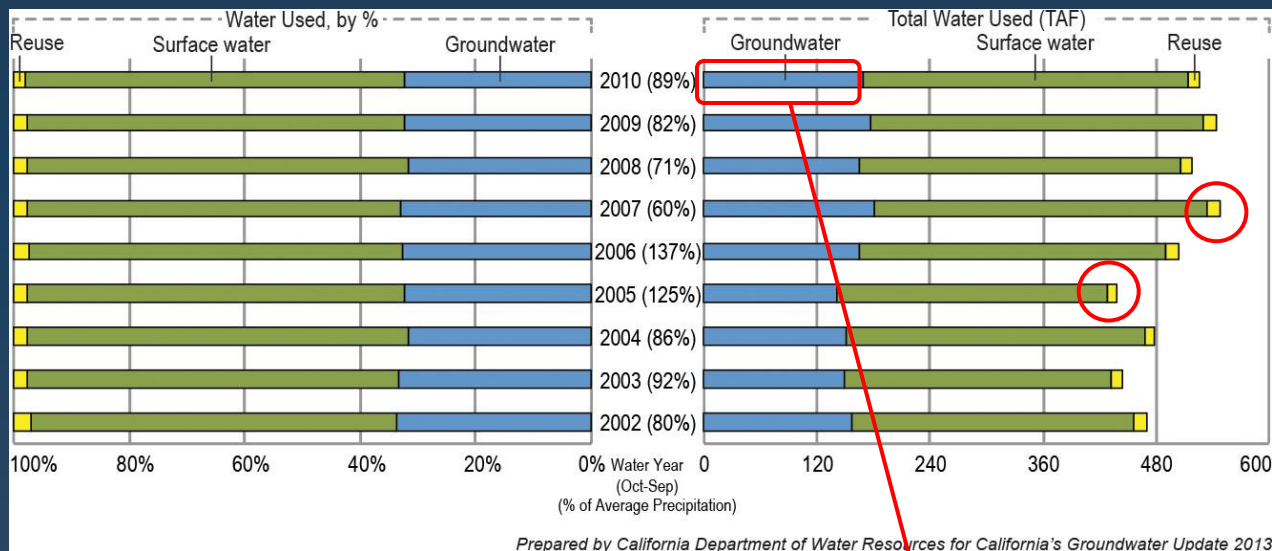
Water Supply Trend (2002-2010)

North Lahontan HR

TOTAL WATER SUPPLY

- High of 548 taf
 - 2007 (60%)
- Low of 439 taf
 - 2005 (125%)

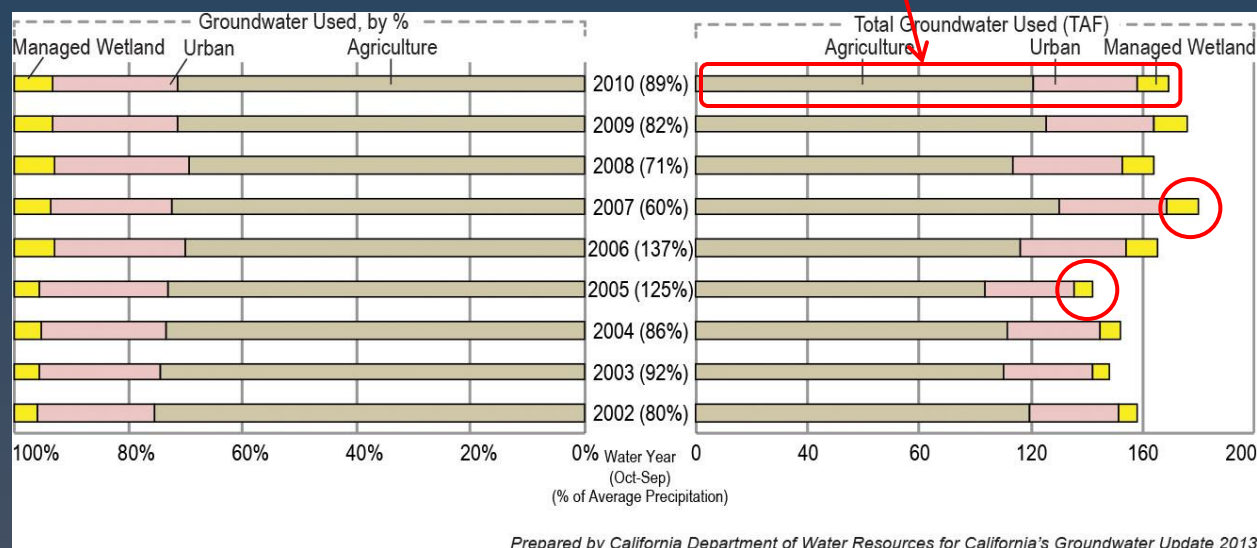
GW meets 32-34% of total supply



GROUNDWATER SUPPLY

- High of 180 taf
 - 2007 (60%)
- Low of 142 taf
 - 2005 (125%)

69-76% of GW is used for agricultural use





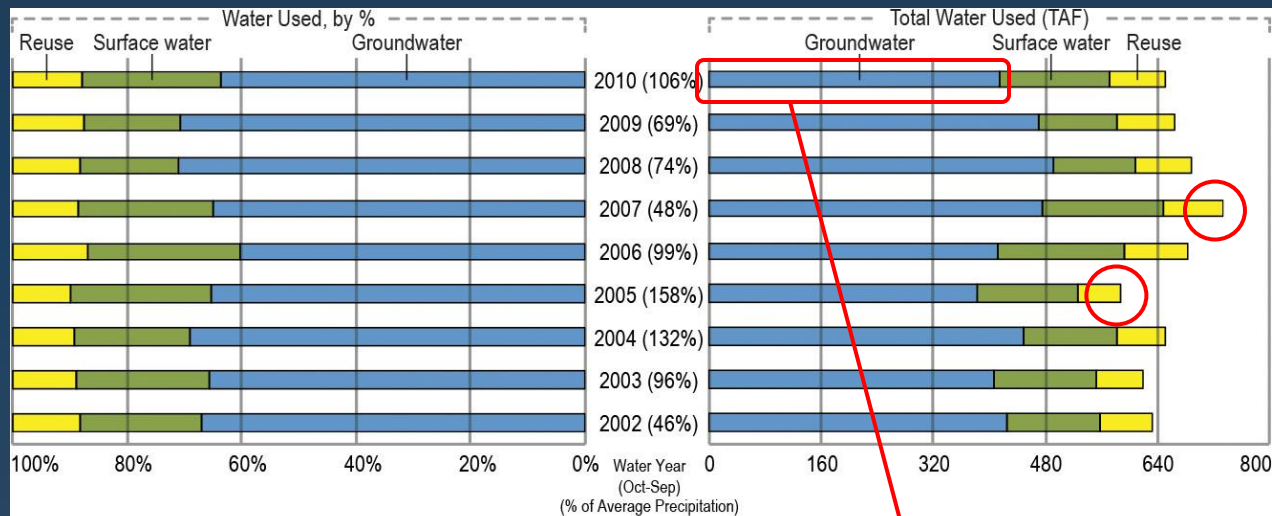
Water Supply Trend (2002-2010)

South Lahontan HR

TOTAL WATER SUPPLY

- High of 733 taf
 - 2007 (48%)
- Low of 586 taf
 - 2005 (158%)

GW meets 60-71% of total supply

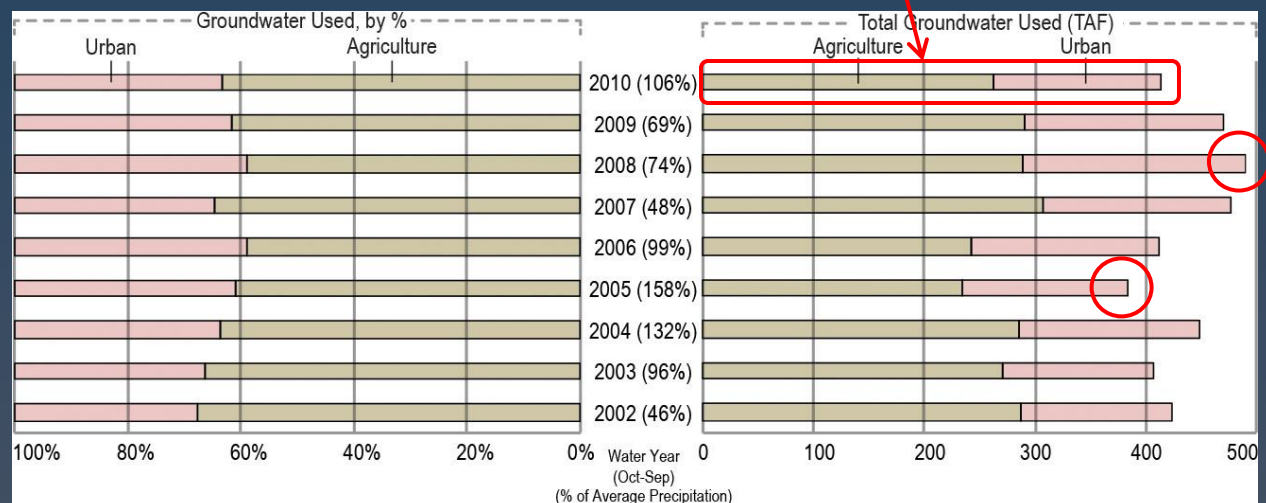


Prepared by California Department of Water Resources for California's Groundwater Update 2013

GROUNDWATER SUPPLY

- High of 491 taf
 - 2008 (74%)
- Low of 384 taf
 - 2005 (158%)

59-68% of GW is used for agricultural use



Prepared by California Department of Water Resources for California's Groundwater Update 2013



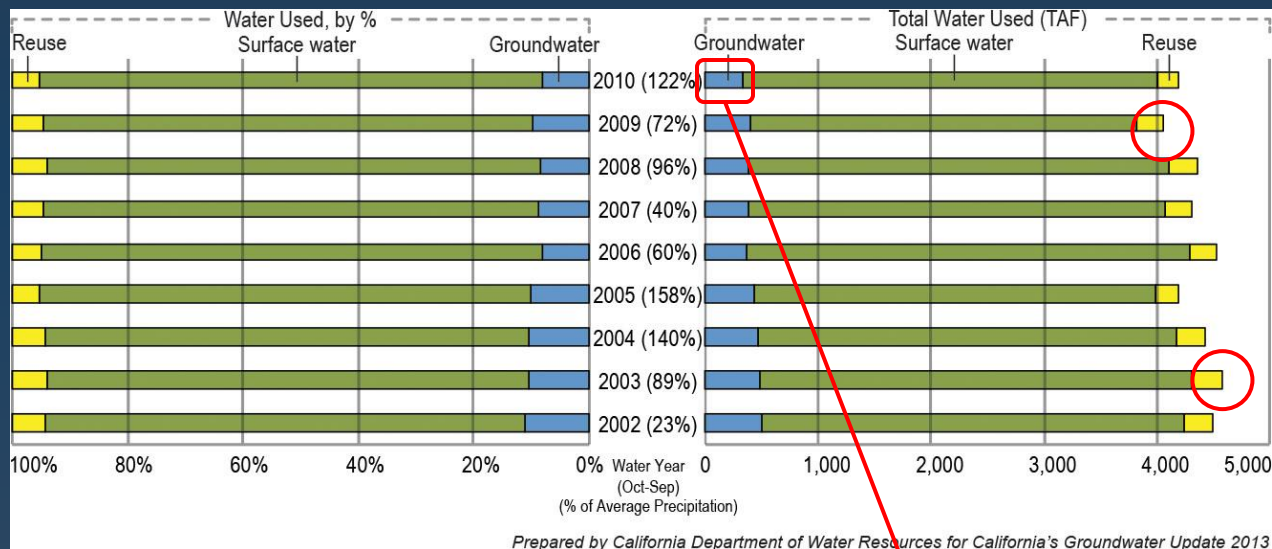
Water Supply Trend (2002-2010)

Colorado River HR

TOTAL WATER SUPPLY

- High of 4,589 taf
 - 2003 (89%)
- Low of 4,052 taf
 - 2009 (72%)

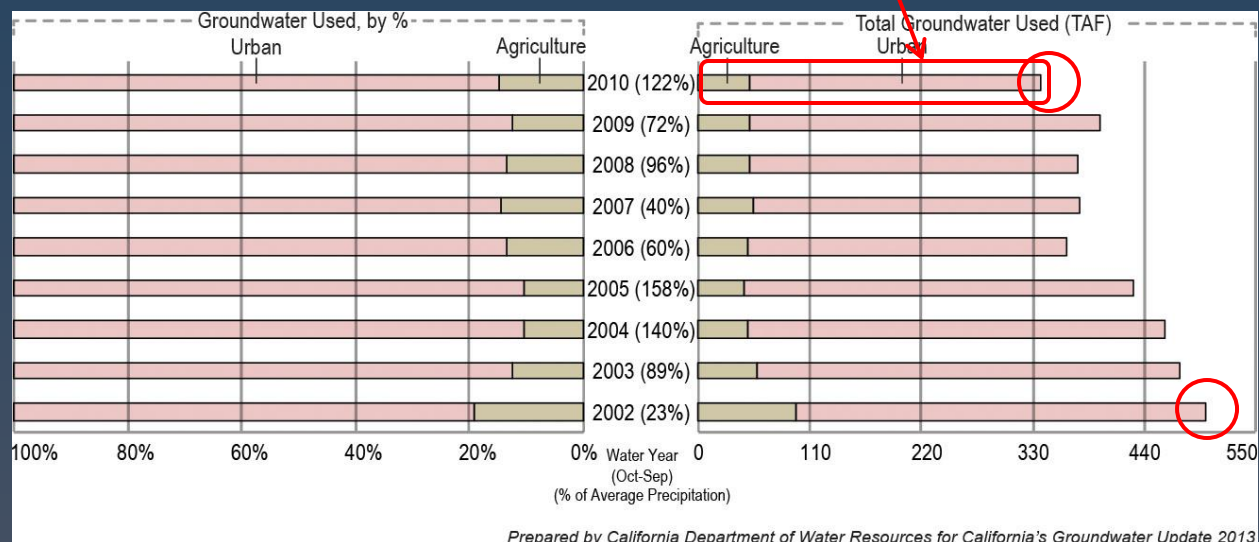
GW meets 8-11% of total supply



GROUNDWATER SUPPLY

- High of 501 taf
 - 2002 (23%)
- Low of 338 taf
 - 2010 (122%)

81-89% of GW is used for urban use



Groundwater Level Trends

North Coast HR



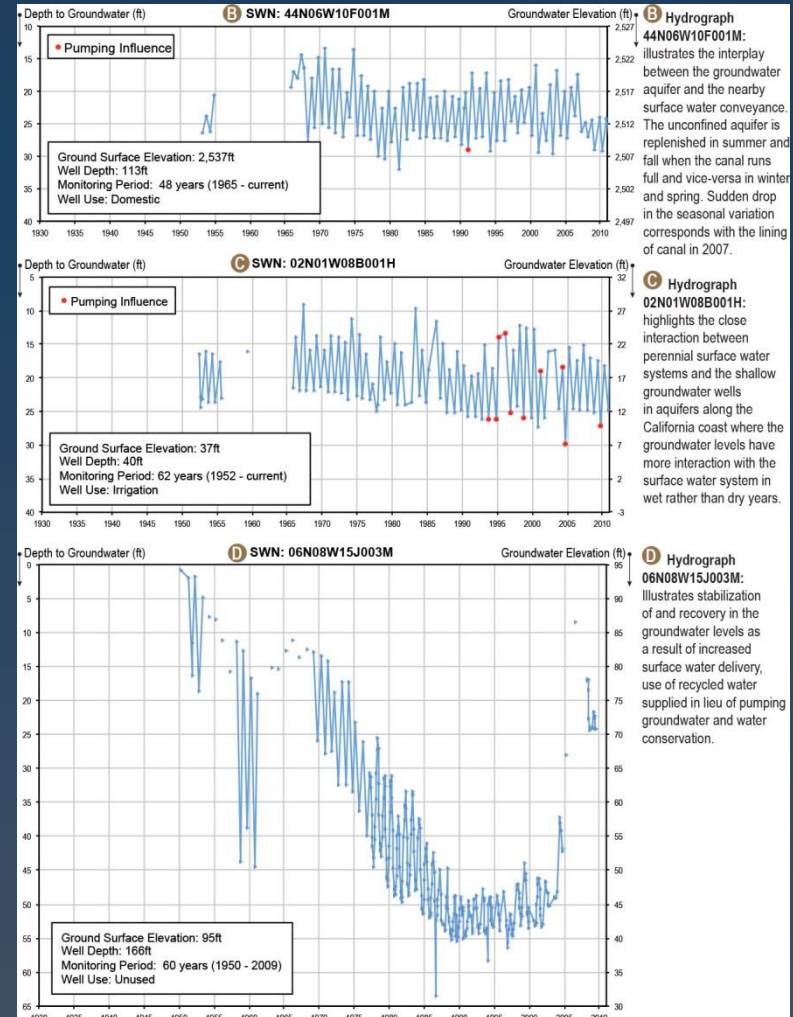
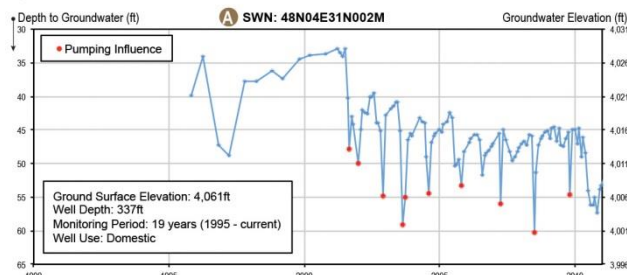
Aquifer response to changing demand and management practices

Hydrographs were selected to help tell a story of how local aquifer systems respond to changing groundwater demand and resource management practices. Additional detail is provided within the main text of the report.

Regional locator map



A Hydrograph 48N04E31N002M: shows the impact of deep high capacity pumps, fluctuating surface water deliveries, and long-term drought conditions.



Groundwater Level Trends

North Lahontan HR



Aquifer response to changing demand and management practices

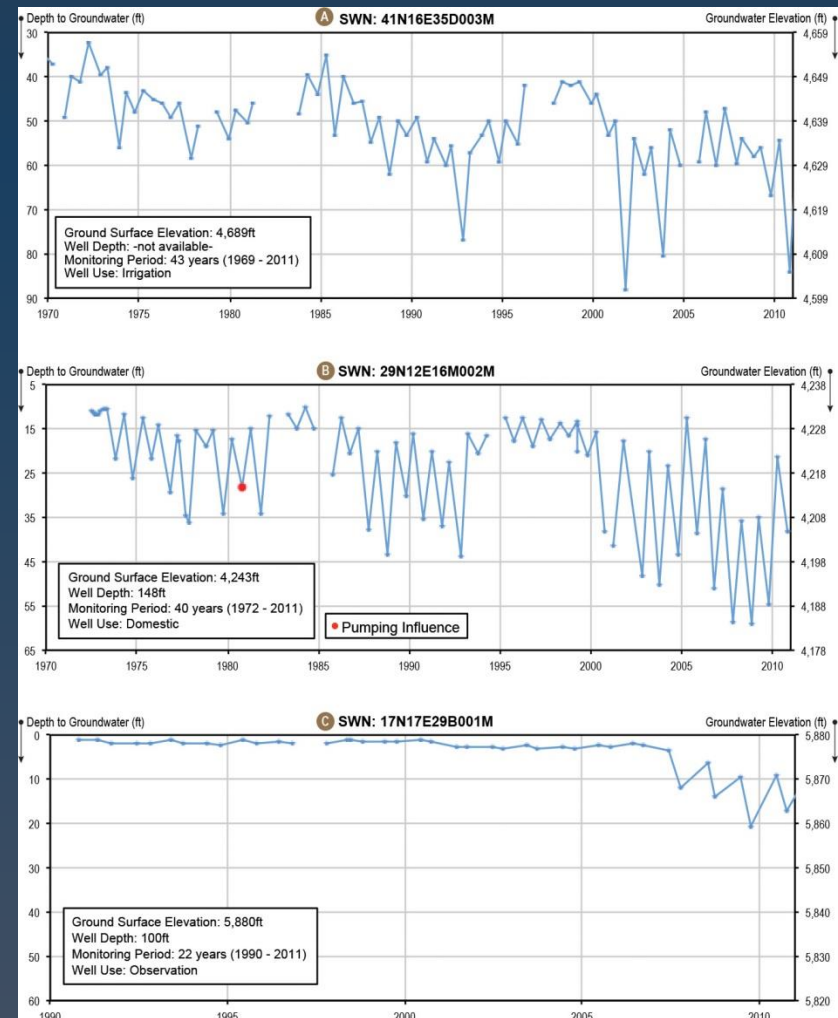
Hydrographs were selected to help tell a story of how local aquifer systems respond to changing groundwater demand and resource management practices. Additional detail is provided within the main text of the report.

Hydrographs A 41N16E35D003M, B 29N12E16M002M and C 17N17E29B001M: shows the aquifer response to the long-term hydrologic cycles and season variations associated with local precipitation conditions. The large seasonal fluctuations in the recent years indicate intensification of pumping activity.

Regional locator map



Prepared by California Department of Water Resources for California's Groundwater Update 2013



Groundwater Level Trends

South Lahontan HR



Regional locator map

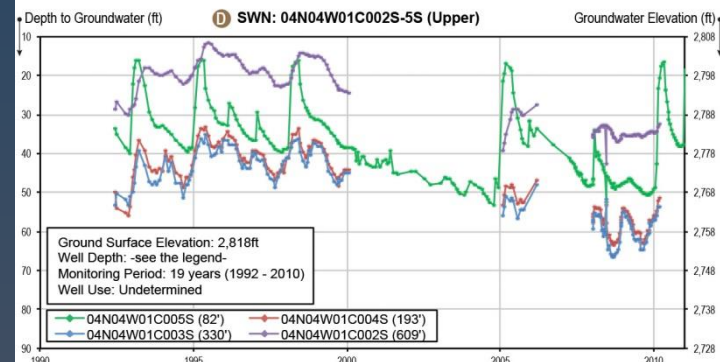
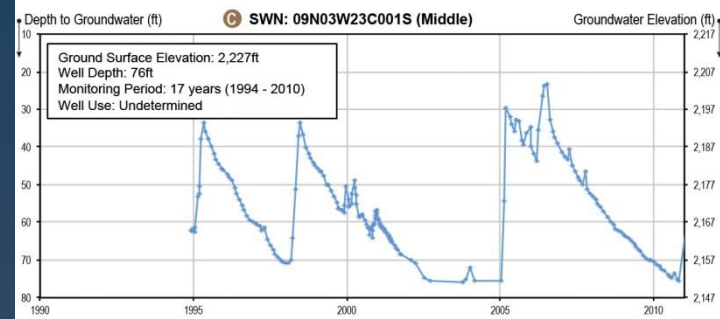
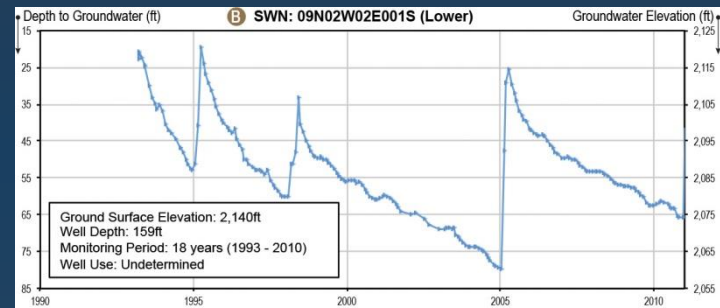
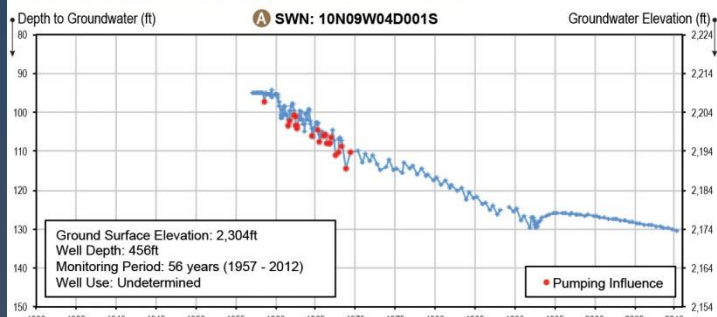


Aquifer response to changing demand and management practices

Hydrographs were selected to help tell a story of how local aquifer systems respond to changing groundwater demand and resource management practices. Additional detail is provided within the main text of the report.

A Hydrograph 10N09W04D001S: illustrates the stabilization of declining groundwater levels through increased pumping costs and introduction of SWP water in 1970s. The rapid urban growth of 1980s, however, offset the recovery and resumed the downward trend in the groundwater levels.

B C D Hydrograph 09N02W02E001S, 09N03W23C001S, and 04N04W01C002S-5S: highlights the inter-connected aquifer response to the precipitation conditions in the Lower, Middle and Upper Mojave River Valley Groundwater Basins, respectively. The aquifers underlying the three basins consist of very porous sediments which allow rapid water infiltration resulting in rapid increase in groundwater elevations during periods of heavy precipitation. The delayed recharge response in Middle and Lower Mojave River Groundwater Basins is most likely due to the fact that the Mojave River is an ephemeral river and does not have water flow along its entire reach except during very large wet cycles. With the exception of notably large wet cycles, the majority of the aquifer recharge within the Mojave River drainage system occurs along the upper reaches of the Mojave River and is less pronounced in the middle and lower reaches of the drainage system.



Prepared by California Department of Water Resources for California's Groundwater Update 2013

Groundwater Level Trends

Colorado River HR

Aquifer response to changing demand and management practices

Hydrographs were selected to help tell a story of how local aquifer systems respond to changing groundwater demand and resource management practices. Additional detail is provided within the main text of the report.

A Hydrograph 02S01E33J004S: shows the aquifer response to the long-term hydrologic cycles and season variations associated with local precipitation conditions. Despite the large fluctuations in the groundwater levels, the overall aquifer response to long-term changes in demand appears to be relatively stable.

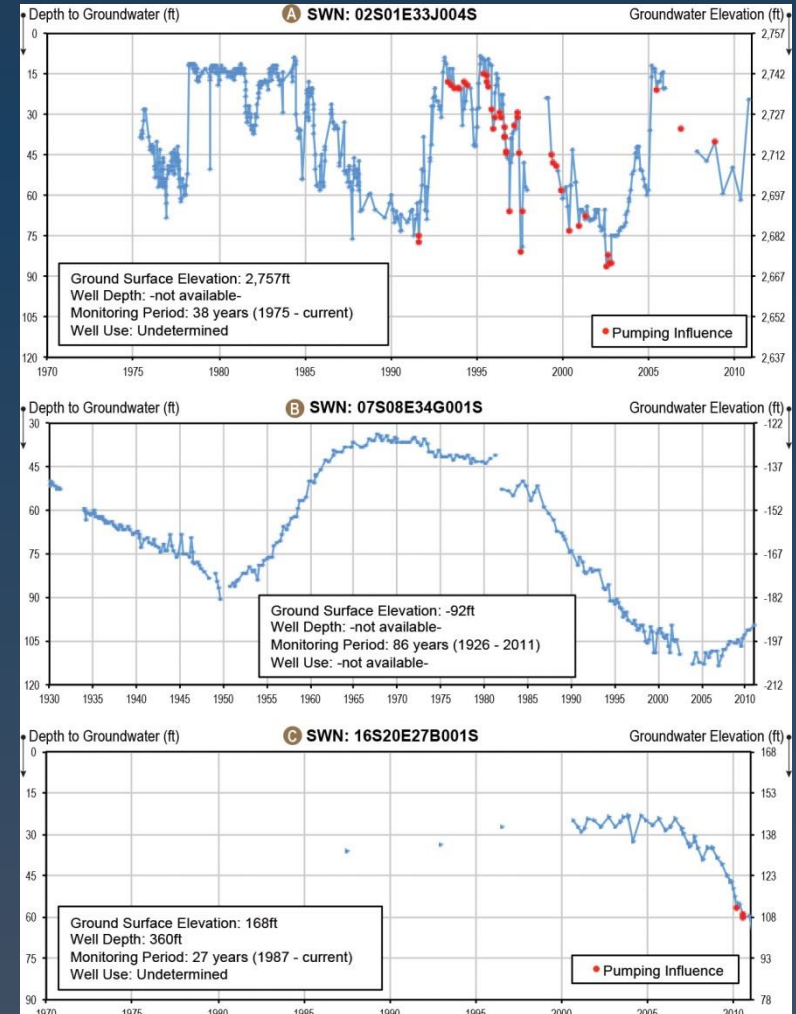
B Hydrograph 07S08E34G001S: highlights the long-term impact of unsustainable reliance on groundwater supplies. The early declining trend in groundwater levels was reversed by introducing imported surface water deliveries in 1950s. The latter declining trend was stabilized by conjunctive management of surface water and groundwater supplies beginning in 2005.

C Hydrograph 16S20E27B001S: illustrates the interplay between the groundwater aquifer and the nearby surface water conveyance. The unconfined aquifer is replenished in summer and fall when the canal runs full and vice-versa in winter and spring. Sudden drop in the seasonal variation corresponds with the lining of All American Canal in 2007.

Regional locator map



Prepared by California Department of Water Resources for California's Groundwater Update 2013





Groundwater Management

Past and Present Legislation

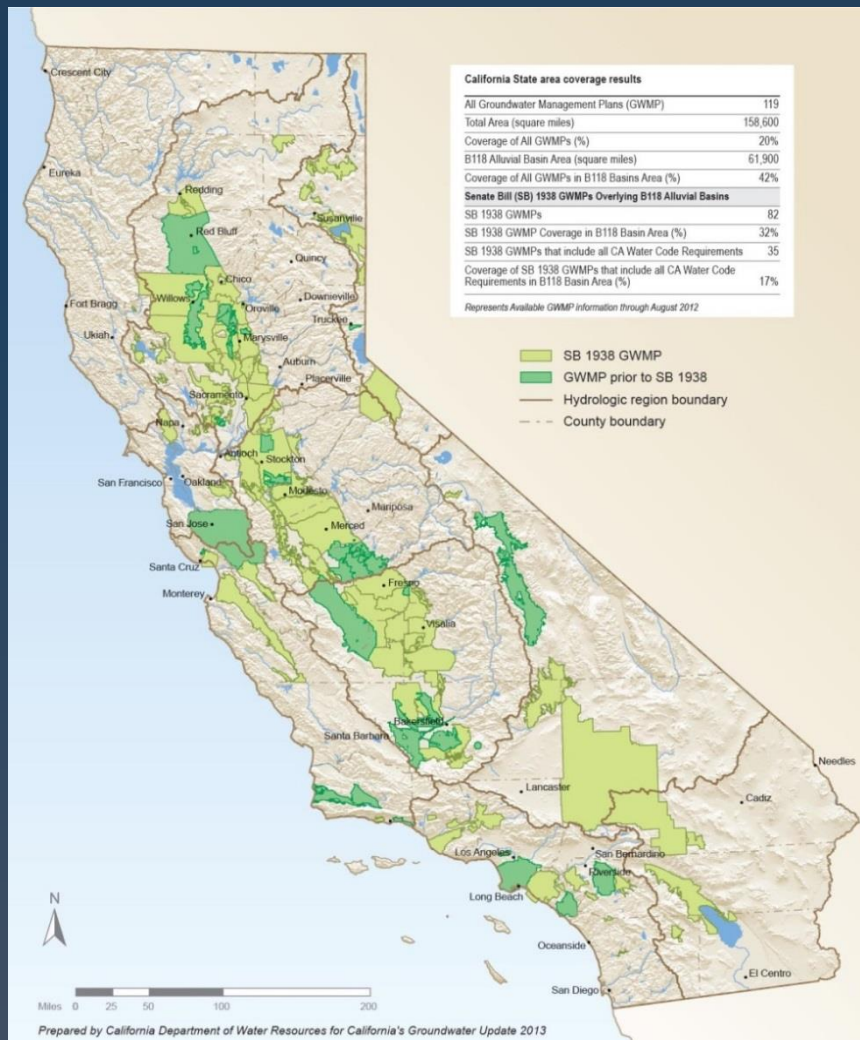
- 1992: Groundwater Management Plans (GWMP) — AB 3030
- 2000: Local Groundwater Assistance grants - AB 303
- 2002: GWMP requires specific elements to be eligible for GW related grant funds - SB 1938
- 2009: CASGEM — Statewide seasonal and long-term groundwater elevation monitoring and Basin Prioritization - SBx7-6
- 2011: GWMP require groundwater recharge mapping and GWMP submittal to DWR - AB 359
- 2014: Sustainable Groundwater Management Act (SGMA) - SB 1168, AB 1739, SB 1319

Notes:

California Water Code Sections, Part 2.74 and 2.75

California Statewide Groundwater Elevation Monitoring

Groundwater Management Plan Statewide Inventory and Assessment

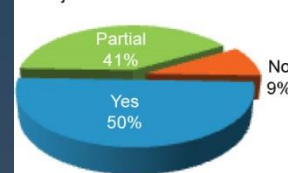


California State area coverage results

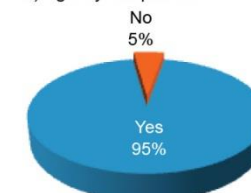
All Groundwater Management Plans (GWMP)	119
Total Area (square miles)	158,600
Coverage of All GWMPs (%)	20%
B118 Alluvial Basin Area (square miles)	61,900
Coverage of All GWMPs in B118 Basins Area (%)	42%
Senate Bill (SB) 1938 GWMPs Overlaying B118 Alluvial Basins	
SB 1938 GWMPs	82
SB 1938 GWMP Coverage in B118 Basin Area (%)	32%
SB 1938 GWMPs that include all CA Water Code Requirements	35
Coverage of SB 1938 GWMPs that include all CA Water Code Requirements in B118 Basin Area (%)	17%

Represents Available GWMP information through August 2012

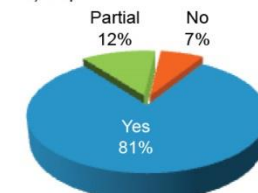
A) Basin Management Objectives



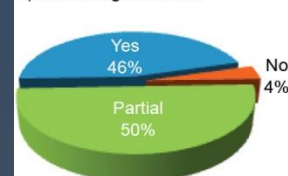
B) Agency Cooperation



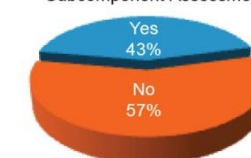
C) Map



D) Monitoring Protocols



E) Combined Component and Subcomponent Assessment



Prepared by California Department of Water Resources for California's Groundwater Update 2013

Groundwater Management

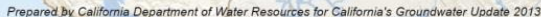
North Coast HR



North Coast Hydrologic Region area coverage results

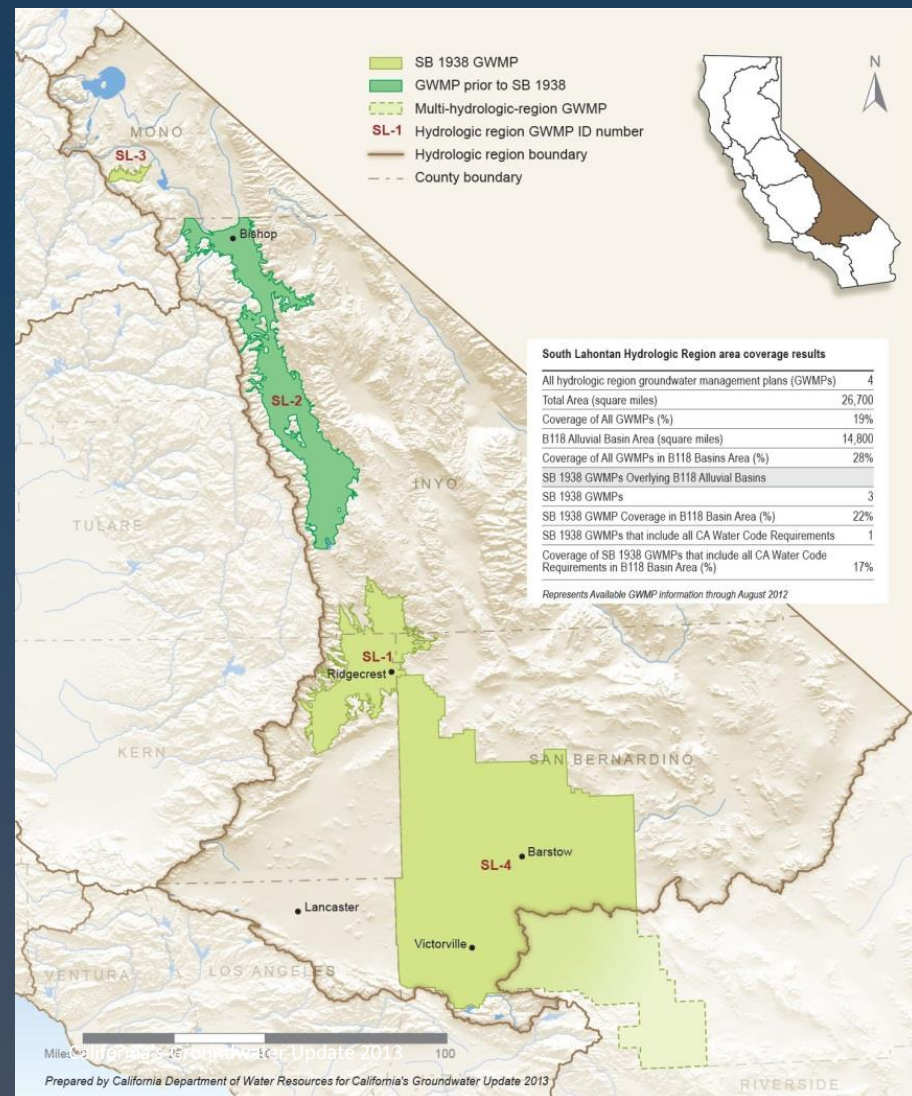
All hydrologic region groundwater management plans (GWMPs)	4
Total Area (square miles)	19,400
Coverage of All GWMPs (%)	0.46%
B118 Alluvial Basin Area (square miles)	1,600
Coverage of All GWMPs in B118 Basins Area (%)	0.36%
SB 1938 GWMPs Overlying B118 Alluvial Basins	
SB 1938 GWMPs	4
SB 1938 GWMP Coverage in B118 Basin Area (%)	0.36%
SB 1938 GWMPs that include all CA Water Code Requirements	0
Coverage of SB 1938 GWMPs that include all CA Water Code Requirements in B118 Basin Area (%)	0%

Represents Available GWMP information through August 2012

Represents Available GWMP information through August 2012

Groundwater Management

South Lahontan HR



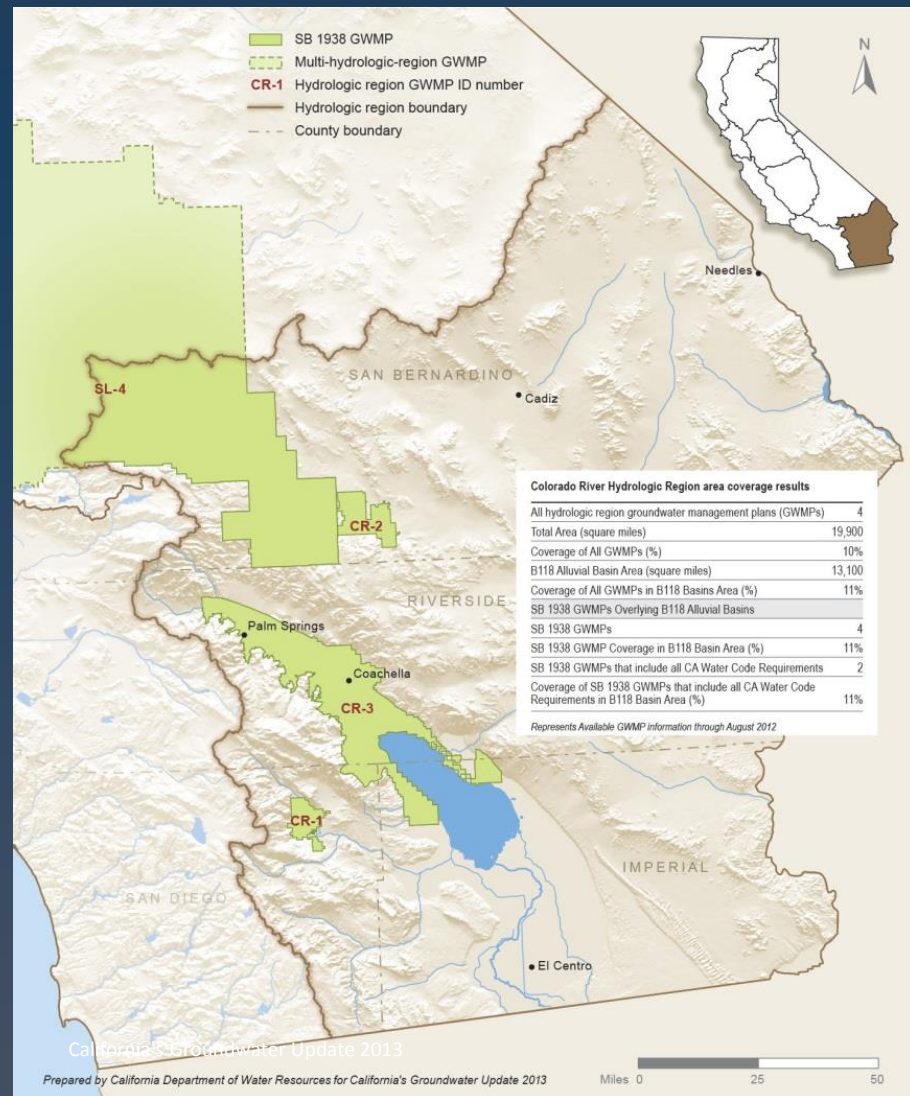
South Lahontan Hydrologic Region area coverage results

All hydrologic region groundwater management plans (GWMPs)	4
Total Area (square miles)	26,700
Coverage of All GWMPs (%)	19%
B118 Alluvial Basin Area (square miles)	14,800
Coverage of All GWMPs in B118 Basins Area (%)	28%
SB 1938 GWMPs Overlying B118 Alluvial Basins	3
SB 1938 GWMPs	3
SB 1938 GWMP Coverage in B118 Basin Area (%)	22%
SB 1938 GWMPs that include all CA Water Code Requirements	1
Coverage of SB 1938 GWMPs that include all CA Water Code Requirements in B118 Basin Area (%)	17%

Represents Available GWMP information through August 2012

Groundwater Management

Colorado River HR



Colorado River Hydrologic Region area coverage results

All hydrologic region groundwater management plans (GWMPs)	4
Total Area (square miles)	19,900
Coverage of All GWMPs (%)	10%
B118 Alluvial Basin Area (square miles)	13,100
Coverage of All GWMPs in B118 Basins Area (%)	11%
SB 1938 GWMPs Overlying B118 Alluvial Basins	
SB 1938 GWMPs	4
SB 1938 GWMP Coverage in B118 Basin Area (%)	11%
SB 1938 GWMPs that include all CA Water Code Requirements	2
Coverage of SB 1938 GWMPs that include all CA Water Code Requirements in B118 Basin Area (%)	11%

Represents Available GWMP information through August 2012

Groundwater Management

Adjudications

- Adjudicated Action
 - Court determines the right to extract groundwater from a basin or store water within a basin
- Bulletin 118-2003
 - 19 GW Adjudications
- CWP Update 2013
 - 24 GW Adjudications
- SGMA Legislation:
 - 26 GW Adjudications
 - 3 other identified areas



Groundwater Management Ordinances

All 58 counties surveyed as of 2012

- Most common ordinance:
 - Policies addressing well abandonment and construction
- Least common ordinance:
 - Groundwater management
 - Use of guidance committees



County	Groundwater Management	Guidance Committees	Export Permits	Recharge	Well Abandonment and Destruction	Well Construction Policies
Alameda	-	-	-	-	Yes	Yes
Alpine	-	-	Yes	-	Yes	Yes
Amador	-	-	-	-	Yes	Yes
Butte	Yes	Yes	Yes	-	Yes	Yes
Calaveras	-	-	Yes	-	Yes	Yes
Colusa	-	-	Yes	-	-	Yes
Contra Costa	-	-	-	-	Yes	-
Del Norte	-	-	-	-	Yes	-
El Dorado	-	-	-	-	Yes	Yes
Fresno	-	-	Yes	-	Yes	Yes

Groundwater Management Ordinances

- North Coast
- North Lahontan
- South Lahontan
- Colorado River

County	Groundwater Management	Guidance Committees	Export Permits	Recharge	Well Abandonment and Destruction	Well Construction Policies
Del Norte	-	-	-	-	Yes	-
Glenn	Yes	Yes	-	-	Yes	Yes
Humboldt	-	-	-	-	-	Y
Lake	-	-	Yes	-	Yes	Yes
Mendocino	-	-	-	-	Yes	Yes
Modoc	-	-	Yes	-	-	Yes
Siskiyou	-	Yes	Yes	-	Yes	-
Sonoma	-	-	-	-	Yes	Yes
Trinity	-	-	-	-	-	Yes

Note:

Table represents information as of August 2012.

County	Groundwater Management	Guidance Committees	Export Permits	Recharge	Well Abandonment and Destruction	Well Construction Policies
Alpine	-	-	Yes	-	Yes	Yes
El Dorado	-	-	-	-	Yes	Yes
Lassen	Yes ^a	Yes	Yes	-	Yes	-
Modoc	-	-	Yes	-	-	Yes
Mono	-	-	Yes	-	Yes	Yes
Nevada	-	-	-	-	Yes	Yes
Placer	-	-	-	-	Yes	Yes
Sierra	-	-	Yes	-	-	-

Notes:

^aEstablishes basin management objectives.

Table represents information as of August 2012.

County	Groundwater Management	Guidance Committees	Export Permits	Recharge	Well Abandonment and Destruction	Well Construction Policies
Imperial	Yes ^a	Yes	Yes	Yes	-	-
San Bernardino	Yes ^b	-	-	-	Yes	Yes
San Diego	Yes ^c	-	-	-	-	-
Riverside	-	-	-	-	Yes	Yes

Notes:

^a Provides for the reduction of extractions to eliminate existing or threatened conditions of overdraft.

^b One provision is to ensure that groundwater extractions do not exceed safe yields.

^c One provision requires developers to demonstrate adequate groundwater supplies for a proposed project.

Table represents information as of August 2012.

County	Groundwater Management	Export Permits	Recharge	Well Abandonment and Destruction	Well Construction Policies
Inyo	-	Yes	-	Yes	Yes
Kern	-	Yes	-	-	Yes
Los Angeles	-	-	Yes	-	-
Mono	Yes ^a	Yes	-	Yes	Yes
San Bernardino	Yes ^a	-	-	Yes	Yes

Notes:

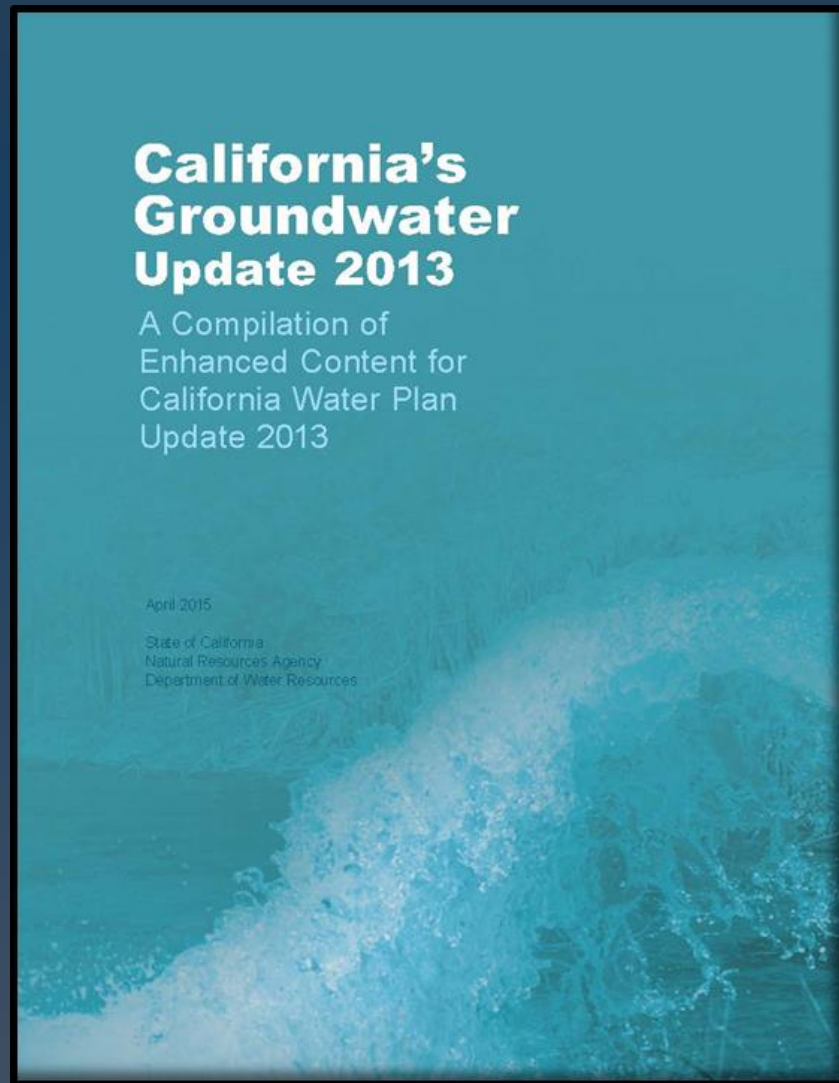
^aProvide protection against exceeding the safe yield of a groundwater basin and the impacts associated with exceeding the safe yield.

Table represents information as of August 2012.

Groundwater Management

Other Efforts

- Special “Act” Districts
- Other Groundwater Management Efforts
 - Integrated Regional Water Management Plans
 - Urban Water Management Plans
 - Agricultural Water Management Plans



Conjunctive Management Inventory



- Location of project
- Year project was developed
- Capital costs
- Annual operating cost
- Administrator/operator
- Capacity in units of acre-feet
- Source of water received
- Put and take capacity
- Type of project
- Program goals and objectives
- Constraints on development of program

Table of 89 survey responses will be included as Appendix D



Groundwater Quality Information in All HR Chapters

Information compiled by Regional Water Quality Control Boards

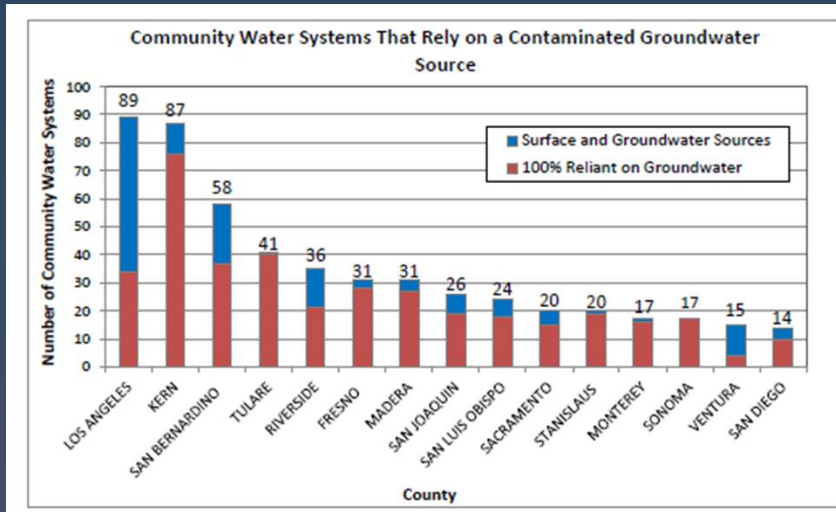
- Table of Data Sources
- Quality at Community Drinking Water Wells
- GAMA Priority Basin Project
- Groundwater Quality at Domestic Wells
- Groundwater Quality Protection
 - Regional Protection Strategy
 - Salt and Nutrient Management Plans
- DWR WDL Water Quality Data

Ten Most Frequently Detected Principle Contaminants in Community Water System Wells			
Principal Contaminant	Number of Wells	Number of Community Water Systems	Type of Contaminant
Arsenic	587	287	Naturally occurring
Nitrate	451	205	Anthropogenic nutrient ¹
Gross alpha activity	333	182	Naturally occurring
Perchlorate	179	57	Industrial/military use ¹
Tetrachloroethylene (PCE)	168	60	Solvent
Trichloroethylene (TCE)	159	44	Solvent
Uranium	157	89	Naturally occurring
1,2-dibromo-3-chloropropane (DBCP)	118	36	Legacy pesticide
Fluoride	79	41	Naturally occurring
Carbon tetrachloride	52	17	Solvent

Notes:

1. Also can be naturally occurring, but typically at levels below maximum contaminant level.

Source: SWRCB, 2013, Communities that Rely on a Contaminated Source for Drinking Water





California's Groundwater Update 2013

Hydrologic Region Recommendations

- **Findings**

- Groundwater Supply and Development
- Groundwater Use and Aquifer Conditions
- Groundwater Monitoring Efforts
- Groundwater Management and Conjunctive Management

- **Data Gaps**

- Data Collection and Analysis
- Basin Assessments
- Sustainable Management

- **Recommendations**

- Similar to Statewide recommendations but HR specific



California's Groundwater Update 2013

Statewide Recommendations

1. Promote **public education** about groundwater.
2. Improve **collaboration**, coordination, and alignment among agencies.
3. Develop a statewide groundwater management planning Web site to promote easy access to groundwater **information**.
4. Improve **essential data** to enable sustainable groundwater management by expanding and funding the CASGEM Program.
5. Improve understanding of California's high- and medium- priority groundwater basins by conducting groundwater **basin assessments**.
6. Develop a groundwater sustainability plan evaluation and implementation process.
7. Advance **sustainable groundwater management** within the framework of integrated water management.
8. Review and assist local agencies in developing improved **analytical tools** to assess conjunctive management and groundwater management strategies.
9. Increase local and regional **groundwater recharge and storage**.

California's Groundwater Update 2013



California's Groundwater Update 2013



California's Groundwater Update 2013: A Compilation of Enhanced Content for California Water Plan Update 2013 compiles and analyzes readily-available groundwater information to characterize California's groundwater basins, aquifers, and well infrastructure.

Although previous California Water Plan Updates had included groundwater-related resource management strategies, feedback from advisory committees and other stakeholder groups highlighted the lack of hydrologic region-specific groundwater information in the California Water Plan.

The Update expands and enhances baseline groundwater information on a regional scale, identifies challenges associated with sustainable groundwater management and helps guide implementation of diverse resource management strategies. Statewide and regional findings, data gaps and recommendations to improve groundwater management also are

included.

The report is organized into the following components:

→ California's Groundwater Update

- Front Cover
- Director's Foreword
- Front Matter and Table of Contents
- Statewide Findings, Data Gaps and Recommendations
- Introduction, Scope and Future Directions (Chapter 1)
- Statewide Groundwater Update (Chapter 2)
- Back Cover

→ Hydrologic Region Groundwater Update

- North Coast Hydrologic Region (Chapter 3)
- San Francisco Bay Hydrologic Region(Chapter 4)
- Central Coast Hydrologic Region (Chapter 5)
- South Coast Hydrologic Region (Chapter 6)
- Sacramento River Hydrologic Region (Chapter 7)
- San Joaquin River Hydrologic Region (Chapter 8)
- Tulare Lake Hydrologic Region (Chapter 9)
- North Lahontan Hydrologic Region (Chapter 10)
- South Lahontan Hydrologic Region (Chapter 11)
- Colorado River Hydrologic Region(Chapter 12)



→ Appendices:

- Front Cover
- Appendix A: Methods and Assumptions
- Appendix B: California Statewide Groundwater Elevation Monitoring (CASGEM) Basin Prioritization
- Appendix C: Groundwater Use Data
- Appendix D: Conjunctive Management Survey
- Appendix E: Change in Groundwater in Storage
- Appendix F: Land Subsidence
- Back Cover

Available Online At:

<http://www.waterplan.water.ca.gov/topics/groundwater/index.cfm>

California Water Plan eNews:

https://listserv.state.ca.gov/wa.exe?SUBED1=DWR_CWP_eNews&A=1

CALIFORNIA
WATER PLAN eNEWS

DWR's Groundwater Information



<http://water.ca.gov/groundwater/>

A screenshot of the DWR Groundwater website homepage. The header includes the CA.GOV logo, navigation links (HOME, NEWSROOM & EVENTS, ISSUES, ABOUT US), and a search bar. The main content area is titled "Groundwater" and features an "Introduction" section with text about groundwater's role in California's water supply. A sidebar on the right lists links: "GROUNDWATER HOME", "SUSTAINABLE GROUNDWATER MANAGEMENT", "GROUNDWATER INFORMATION CENTER", "CASGEM", and "BULLETIN 118". Social media icons for Facebook, Twitter, and YouTube are also present. The bottom section includes "The Sustainable Groundwater Management (SGM) Program", "Groundwater Information Center (GIC)", "California Statewide Groundwater Elevation Monitoring (CASGEM) Program", and "Bulletin 118".

DWR's GROUNDWATER WEBSITE

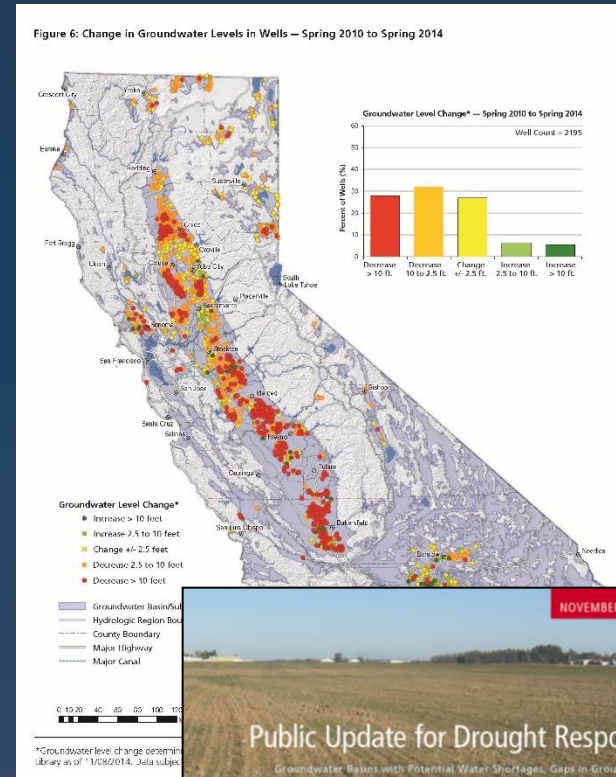
- Sustainable Groundwater Management (SGM) Program
- Groundwater Information Center
- CASGEM Program
- Bulletin 118

Sustainable Groundwater Management Act (SGMA)

- <http://www.groundwater.ca.gov/>

Updated Drought Information - 2014

- CA GW Update 2013 data is presented through 2010 - 2012
- CWP efforts helped facilitate presentation of data in 2014 Drought Updates
- Drought Updates contain data up to 2014
- Reports available on DWR's Groundwater Information Center Web site
- DWR's Drought Information Web Site



<http://www.water.ca.gov/groundwater/gwinfo/index.cfm>

<http://www.water.ca.gov/waterconditions/>



<http://water.ca.gov/groundwater/boundaries.cfm>



[Clear all](#) [Help!](#)

Boundaries Map

-  County Boundaries
-  Region Office Service Areas
-  Hydrologic Regions
-  Prop 1 Funding Areas
-  Prop 84 Funding Areas
-  Regional Water Quality Control Board Boundaries
-  Tribal Lands
-  Military Installations, Ranges, and Training Areas
-  Regional Flood Planning Boundaries
-  Reclamation Districts
-  CA State Park Lands
-  CA Coastal Commission Lands
-  Adjudicated Groundwater Basins
-  CASGEM Designated Monitoring Entities as of 08-19-15
-  CASGEM Groundwater Basin Prioritization
-  Groundwater Management Plans
-  IRWM Regions
-  Federal Lands
-  Disadvantaged Community Block Groups
-  Disadvantaged Community Tracts
-  Disadvantaged Community Places
-  Water Agencies
-  Bulletin 118 Groundwater Basins
-  Detailed Analysis Units
-  Water Plan Planning Areas
-  Watersheds
-  CA Senate Districts
-  CA Assembly Districts

